To Trade or Not to Trade:
The Strategic Trading of Insiders around News Announcements

Adriana Korczak [a, 1], Piotr Korczak [b, 2] and Meziane Lasfer [c,*]

[a] Manchester Business School, Booth Street East, Manchester M13 9PL, United Kingdom

[b] School of Economics, Finance and Management, University of Bristol, 8 Woodland Road, Bristol BS8 1TN, United Kingdom

[c] Cass Business School, 106 Bunhill Row, London EC1Y 8TZ, United Kingdom

15 January 2007

Abstract:

In this paper we test the hypothesis that insiders trade strategically on specific news that offer the optimal trade-off between the incentives to capitalize on foreknowledge of the information content of the disclosure and the disincentives created by risk of the regulatory scrutiny. We use a large number of insider trading and regulatory news announcements data in the UK. We find that, before bad news announcements, insiders are more likely to trade but the relationship between the price impact of the news announcements and likelihood of insider trading before the news are released is non-linear. The argument of the trade-off between incentives to capitalize on foreknowledge and the disincentive created by legal scrutiny is reflected in strategic trading before bad news; however the results for good news are less obvious.

JEL Classification: G14, G18, K22

Keywords: Insider trading, Information disclosure, Regulation, Information asymmetries

*_Corresponding author:_ Tel.: +44 20 7040 8634; Fax: +44 20 7040 8648; email: m.a.lasfer@city.ac.uk.

[1] email: adriana.korczak@mbs.ac.uk

[2] email: p.korczak@bristol.ac.uk

The usual disclaimer applies.

To Trade or Not to Trade:
The Strategic Trading of Insiders around News Announcements

1. Introduction

Studies, on the association between insider trading and subsequent significant corporate events emerged as soon as excess returns earned by insiders were confirmed in seminal papers by Jaffe (1974), Finnerty (1976) Seyhun (1986). A widely accepted explanation for such insiders' abnormal profits was superior knowledge about their firms' prospects and the use of this foreknowledge in trading decisions. However, previous studies provide mixed empirical evidence on the link between insider trades and subsequently news announcements. In particular, while insiders are found to trade several months or even years before significant corporate events, such as corporate sell-offs (Hirschey and Zaima 1989), takeover bids (Seyhun 1990b), dividend initiations (John and Lang 1991), seasoned equity offerings (Karpoff and Lee 1991), stock repurchases (Lee *et al.* 1992), bankruptcies (Seyhun and Bradley 1997), and earnings downturns (Ke *et al.* 2003), their propensity to trade is reduced as the event approaches. For example, Ke *et al.* (2003) find little abnormal insider selling in two quarters immediately prior to the earnings downturn, and Huddart *et al.* (2006) find that insiders refrain from trading profitably in short windows of 20 days before earnings announcements. As a result, the correlation between insider trading behavior and contemporaneous firm performance is weak (Piotroski and Roulstone 2005), and little association is found between insider trading and the subsequent management earnings forecasts (Noe 1999), the content of earnings announcements (Sivakumar and Waymire, 1994) and a wide range of non-earnings announcements, including dividends news and operational plans (Givoly and Palmon 1985). However, other studies find a strong relationship between insider trading and the information content of the proximate earnings releases (e.g., Lustgarten and Mande, 1995), and insiders profit from superior knowledge about proximate filings of Forms 10-K and 10-Q that contain detailed financial results (e.g., Huddart *et al.,* 2006).

The decrease in the propensity of insiders to trade on private information just before corporate events can be explained by the increased risks of regulatory scrutiny and litigation. The role of regulations is supported by the fact that the insider trading patterns change with the changes in securities law (e.g., Garfinkel 1997; Piotroski and Roulstone 2005). In general, laws regulating insider trading are relatively common across the vast majority of countries

although their level of enforcement differs from one country to another (Bettis *et al.* 2000; Bhattacharya and Daouk 2002). The practices by governments around the world have a common aim to prohibit trading in securities using material nonpublic information in order to promote fairness of the market and to prevent insiders from abusing their privileged position. In several countries a specific form of regulation involves trading bans during periods when insiders are expected to be particularly advantaged compared to outsiders, mainly in the run-up to announcements of price-sensitive information. For example, in the U.K. the introduction of the trading bans in periods leading up to significant corporate announcements ensures that insiders in their trading decisions 'do not abuse, and do not place themselves under suspicion of abusing, inside information that they may be thought to have' (*Listing Rules, FSA Handbook*, July 2006, p. 131). Legal and economic importance of explicit insider trading blackout periods is supported by the fact that even if the bans are not introduced at country-level, like in the U.S., the majority of firms include them in their firm-level insider trading policies (Bettis *et al.* 2000).[1]

The purpose of this paper is to shed more light on the strategic trading of insiders and the ways insiders use short-lived private information. We argue that the decisions to trade on foreknowledge of corporate news in short windows directly preceding the news announcements is likely to be taken strategically and will result from a trade-off between the incentives to capitalize on foreknowledge of the information content of the disclosure and the disincentives created by risk of the regulatory scrutiny.[2] We consider that insiders, because of their knowledge and experience, are likely to know the information content of the upcoming disclosure and can predict how the market will react when the disclosure is made. The more relevant the information released to the market, the larger is the profit that an insider can make by trading on this information. However, the jeopardy of a potential regulatory action against the insider is expected to be higher if the forthcoming news release is highly price-sensitive and consequently this may prevent the insider from trading. We build on Piotroski and Roulstone (2005) and Huddart *et al.* (2006) evidence that insiders limit their trading on information with strong market impact. Piotroski and Roulstone (2005) find that firm-year observations with insider trading have smaller absolute changes in current and future profitability than firm-years without insider trading. Similarly Huddart *et al.* (2006) report that the frequency and the volume of insider transactions decrease with the magnitude of the stock price impact of the upcoming earnings disclosure. We investigate the issue in more depth by including all news announcements and by allowing for a nonlinear relationship between the price content of the upcoming disclosure and the insider's decision to trade.

Since the potential jeopardy is lower when the news release has a lower price impact as it is not price sensitive, insiders may be more prone to use their private information advantage to trade profitably in the lower range of the anticipated stock price movements around disclosures, and they would withhold from trading if the price impact of the proximate disclosure is large.

We test the hypothesis that insiders time their trades by buying (selling) before positive (negative) news announcements and their probability of trading is non-linearly related to the level of the information content of the news as reflected in the market reaction on the announcement date. Such a trading behaviour is expect to be consistent with the notion that insiders trade-off the cost (risk of the regulatory scrutiny) and benefit (capitalization on foreknowledge of the information content of the disclosure) of trading on insider information. To do this, we collect data on all news announcements made by U.K. companies over our sample period, compute the market reaction to each event, classify each news as good when there is a positive market reaction and as bad when the market reaction is negative, and then apply a set of logit models to estimate how this information content influences the insiders' decisions to trade. In the case of multiple announcements we analyze whether insiders are net buyers before good news and net sellers before bad news.

We contribute to the insider trading research in three major ways. First, we extend earlier studies that predominantly focus on insider transactions and exclude firms and periods without any trades. We look from a different angle to explore trading against no-trading decisions as we base our analysis on the notion that a decision not to trade is equally important as a decision to trade. Assuming that trading is driven by insiders' private information, we argue that a decision not to trade does not necessarily signal that the private information does not differ from market expectations, but could mean that the private information will have a significant price impact when released to the market and insiders refrain from trading on it to avoid the risk of regulatory scrutiny. Second, while previous studies on insider trading behavior in the short term around significant corporate events focus on earnings announcements, we analyze insider trading decisions around all types of corporate news. In line with common international practices, U.K. regulations prohibit trading at any time before the announcement of any information which may constitute inside information, and inside information is defined as the information that is likely to have a significant impact on share price (see *Disclosure Rules*, *FSA Handbook*, July 2006, p. 17). However, as noted by Friederich *et al.* (2002), there is a large gray area open to interpretation and documents of the London Stock Exchange list, among others, dividends, acquisitions,

spin-offs, board changes, security issues, new products, large orders and redundancy programs as non-earnings announcements that may be deemed price-sensitive. Consequently, we aim to shed more light on insider trading behavior around a full set of events when insiders are believed to have information advantage over the public. Finally, we address the asymmetry of insider trading decision before good and bad news. As noted by Cheng and Lo (2006), there is asymmetric risk of litigation after selling before price decreases and buying before price increases. In the case of insider selling on bad news, outside investors suffer real losses when the stock price drops on the announcement and hence the risk of a legal action is larger, while insider buying before good news results in outsiders' opportunity losses only. Consequently, insiders may be more deliberate when selling on the forthcoming bad news than when buying on proximate good news.

We use a sample of 119,179 news announcements made by UK companies and 8,086 insider trading events over the period 1999-2002. We find that insider trading is more intense before bad than before good news announcements across all types of news specific categories. In addition, insider trading before bad news announcements is concentrated more before news with high market impact, whereas insider trading before good news is related to less price sensitive news. The analysis of trading ban periods reveals that insiders refrain from trading before good news in the ban periods. However, the legal disincentive diminishes with an increase in market impact of the news. The trade-off between incentives to capitalize on foreknowledge and disincentives created by the risk of regulatory scrutiny is clearly reflected in strategic trading before bad news. We show that insiders' propensity to trade profitably before bad news increases as the information content of the news increases, but as the market reaction to the news becomes very large, the potential risks of regulatory scrutiny increase and the insiders' propensity to trade on the information starts to smooth out. When we consider specific news categories we find that the results are ambiguous for good news where propensity to trade before *Earnings, Other Results and Dividends* and *Restructuring* decreases but at a diminishing pace as the news becomes more extreme. For Ownership and Capital Structure the observed trend of likelihood of insider trading before good news is similar to the trend observed for *Earnings Other Results and Dividends* and *Board Changes* before bad news and supports the argument that there is a trade-off between the incentive to capitalize on foreknowledge of the information content and the disincentive created by legal scrutiny.

The rest of the paper is organised as follows. In section 2 we provide the theoretical background. In Section 3 we describe the data and methodology. In Section 4 we present the empirical findings. Conclusions are in Section 5.

2. Theoretical background

In this section we provide a review of the literature on insider trading, details the UK institutional framework and set up our hypotheses.

2.1. Review of the literature

A number of empirical studies provide evidence that corporate insiders use private information to strategically trade their own shares around corporate events and gain significant abnormal returns. For example, research has shown that insiders trade around the announcement of new stock offering (Karpoff and Lee 1991), stock repurchases (Lee *et al.* 1992), filing for bankruptcy protection (Seyhun and Bradley 1997), earnings forecasts (Penman 1982), takeovers (Seyhun 1990a), dividend announcements (John and Lang 1991), and exchange listings and de-listings (Lamba and Khan 1999).

There is, however, a debate in the literature as to whether, even if insiders trade on insider information, such abnormal returns are high enough to allow outsiders to obtain any exceptional returns because of transactions costs (Jeng *et al. 2006*; Seyhun 1986; Pope *et al.* 1990; Gregory *et al.* 1994; Gregory *et al.* 1997; Friederich *et al.* 2002), or the strategic trading behaviour of insiders who deliberately disguise their trades in order to "reap profits" at outsiders' expense (John and Narayanan 1997). In addition, the trades of insiders are not likely to be all based on private information as insiders could trade for liquidity reasons or to signal undervaluation when they are able to better assess the value of the firm and take a long-term view of the company's prospects (Gregory *et al.* 1994).[3]

Overall, insider gains imply that financial markets do not compound private information and that there is a wealth transfer from uninformed investors to individuals with privileged information (Finnerty 1976; Seyhun 1986; Gregory *et al.* 1997; Friederich *et al.* 2002). These gains and the contending motives for insider trading have resulted in controversies as to whether insider trading should be encouraged or regulated. Given that insider trading increases efficiency as prices after the trades will reflect both publicly and privately held information, the rules against insider trading prevent prices from reflecting the correct value of the firm and, thus, damages market efficiency (Manne 1966; Meulbroek 1992). In this case insider trading should be permitted and insiders will trade freely to capitalize on foreknowledge of the information content of the disclosure without incurring any risk of regulatory scrutiny. However, if insiders are allowed to trade freely, non-informed investors become aware of the wealth transfer induced by insider trading and will refrain from

trading (Kyle 1985). Such attitude will lead to inefficiency and illiquidity. Therefore, regulators and financial community are likely to track these transactions to fully assess insider gains and any distortions in prices that result from these trades and they should advocate and impose a set of rules to enhance investors' confidence about the fairness of trading in financial markets.[4]

In this paper, we consider that, since insider trading is regulated, insiders are not free to trade before price-sensitive information. However, given the difficulties in defining unambiguously price-sensitive information and the enforcement of the insider trading rules, insiders are likely to weigh the benefits of capitalising on their price information and the likelihood of being scrutinised by the legislation. Therefore, we expect insiders to buy and/or sell stocks in their own company before material information is released if the net benefits relative to the costs are optimised. We use the announcement date abnormal returns as a proxy for the costs and benefits of such trades. We assume that if the market reaction is small, the potential gains are low, therefore, there is no need to trade. On the other hand, if the abnormal returns are very high, the potential probability of being scrutinised is high, refraining insiders from trading. Thus, trading will occur when the optimal benefit is reached.

2.1. U.K. insider trading regulations

The London Stock Exchange introduced the Model Code in 1977 as a non-statutory code of good practice regarding directors' dealing in their companies' shares. According to the regulations, 'prohibited periods' when insiders are banned from trading include 'close periods' associated with earnings announcement and any periods when there exists 'any matter which constitutes inside information in relation to the company' (*Listing Rules, FSA Handbook* July 2006, p. 132). A 'close period' is the period of 60 days preceding the preliminary announcement of annual results, the period of 60 days before the announcement of the half-yearly results if the company reports on a half-yearly basis, and the period of 30 days preceding the announcement of quarterly results if the company reports on a quarterly basis.

An insider is defined by the Code as 'a person discharging managerial responsibilities' and employee of the company or any person related to him who has a direct or indirect access to inside information and has to be included on insider list drown up by the company (*Listing Rules, FSA Handbook* July 2006, p. 131-2; *Disclosure Rules, FSA Handbook,* July 2006, p. 13). Any individual who is identified by law as an insider must not trade in any securities of

the company without having permission ('clearance to deal') to trade from a chairman or a director designated in the company for this purpose. The law allows up to five business days to issue a 'clearance to deal' and two business days to trade after the permission being delivered (*Listing Rules, FSA Handbook* July 2006, p. 134). In line with the regulations clearance is not given during 'prohibited periods' except for a permission to sell when an insider has 'a pressing financial commitment that cannot be satisfied otherwise than by selling the relevant securities of the company' and does not possess any inside information *Listing Rules, FSA Handbook* July 2006, p. 134).

3. Data and methodology

We study a universe of regulatory news announcements made by U.K. listed companies, constituents of the FTSE All Share index, published between January 1999 and December 2002. Our database of news releases includes all regulatory news published in the Regulatory News Service (RNS), the approved regulatory information service provided by the London Stock Exchange, and is collected from Perfect Information. Each record in the database includes date and time of the announcement, company's name and a headline of the announcements. The regulatory news cover information regarding, among others, financial statements, dividends, operating reports, capital structure, restructuring, ownership, company appointments, meetings, deals and transactions, offers, corporate actions and market related announcements. On the basis of the headlines we classify announcements into two broad and eight specific categories. Earnings announcements that are explicitly associated with insider trading bans, as introduced in Section 2, are classified into the *Banned* category in the analysis at the aggregate level and into *Earnings* category when specific types of announcements are analyzed. All other announcements are classified into the *Not Banned* category, to reflect that they are not associated with the explicitly defined trading ban period, and into one of the following specific categories: *Other Results and Dividends*, *Capital Structure*, *Restructuring*, *Ownership*, *Board Changes*, *General Business Information* and *Miscellaneous*. Examples of news items included in each of the specific categories are listed in Appendix A.

Data on insider transactions is collected from Directors Deals Ltd and includes transaction date, announcement date, the name of the company, type of the transaction, and price and volume of the transaction. In line with previous studies on insider trading[5], we focus on open-market trades and exclude transactions that are associated with other corporate actions and events or transactions that are not initiated by insiders, and hence generally cannot

be driven by private information. Such transactions include exercise of options, script dividends, bonus shares, rights issues and awards made to directors under incentive plans or reinvestment plans. In the next step, we match data on insider transactions with the news database and exclude trades for companies for which we have no news coverage. Since our analysis is focused on insider transactions around news announcements, we exclude all announcements of insider transactions from our news database. Overall, in our final sample includes 119,179 news announcements and 8,086 insider trading events. In many cases, there is more than one news announcement by the company published on the same day and in further steps of the analysis, if not stated otherwise, we treat such multiple announcements as one observation. To keep full information on news categories, we assign this observation to all relevant categories to which individual announcements made on this day were initially assigned. Therefore, the sum of observations in news categories is greater that the total number of news items with unique dates. Out of the total of 119,179 news announcements, there are 78,251 news observations (65.66% of the total) with a unique company-date.

We analyze separately good and bad news, defined on the basis of the sign of the abnormal return around the disclosure. We follow Cheng and Lo (2006) and define good (bad) news when the abnormal returns are non-negative (negative). We assume that the market reaction to the disclosure can be observed immediately on the day of the disclosure and on the following day, when the news attracts wider media coverage, particularly if the announcement is made after the stock exchange trading hours. The short event window allows us to avoid contamination of our measure by other events occurring in a larger window around the disclosure. We use the market model to compute the event period abnormal returns, with the coefficients α and β estimated over 260 trading days ending 31 calendar days before the news announcements and the retruns on the FTSE All Share index as the market return. We focus on $CAR_{0,+1}$, (referred thereafter as *CAR*), the sum of the abnormal returns on the announcement (day 0) and the subsequent trading day (day +1). The prices are adjusted for dividends and stock splits and are collected from Datastream.

Each news observation is matched with insider transactions in the news announcing firm within 30 calendar days before the news announcement day. The 30-day period is chosen to reflect the U.K. stock market regulators' view on when insiders have information advantage and their trading may be driven by private information. As outlined in Section 2, U.K. regulations explicitly ban transactions by insiders over 30 calendar days leading up to the announcement of quarterly earnings announcements, with the ban period being extended to 60 calendar days before the announcement of preliminary annual earnings and interim

results. While there is no explicit trading ban before announcement of any other price sensitive information, we assume that the 30 calendar-day period before every announcement reflects time when insiders may be expected to have information advantage. We then deduct the total number of shares sold from the total number of shares purchased by the firm's insiders over the 30 calendar days before the announcement. If the number is positive, that is if the number of shares bought exceeds the number of shares sold, the firm's insiders are net buyers. If the number is negative, that is if the number of shares sold exceeds the number of shares purchased, the firm's insiders are net sellers. News observations preceded by insider transactions in the direction consistent with the direction of the market reaction around news announcement, that is news with non-negative *CAR* (good news) preceded by net buying and news with negative *CAR* (bad news) preceded by net selling are denoted as *News Preceded by Insider Trading*. Otherwise they are denoted as *News without Insider Trading*.[6] Our final sample includes 39,617 good news and 38,634 bad news announcements with 4,083 (10.31%) good news and 6,218 (16.09%) bad news preceded by insider trading.

In the main tests of this paper, we aim to better understand insiders' decisions to trade or not to trade on their foreknowledge of corporate news in short windows directly preceding the news announcements. To analyze when insiders are net buyers before good news announcements and net sellers before bad news announcements, we run the following logit model (for simplicity of the notation subscript *i* is omitted):

$$\text{Prob(Trading = 1)} = \text{logit}\,(\alpha_1 + \beta_1\,\text{Size} + \beta_2\,\text{Market-to-Book} + \beta_3\,\text{Buy-and-Hold 120 pre} + \beta_4\,\text{Multiple News} + \beta_5\,|\text{CAR}| + \beta_6\,\text{CAR}^2 + \varepsilon). \quad (1)$$

Trading is an indicator variable that equals one for *News Preceded by Insider Trading* (as defined above), and zero for *News without Insider Trading*. *Size* is the natural logarithm of the firm's market capitalization (in GBP millions) measured on the day of the news announcement. *Market-to-Book* is the ratio of the market value of shares and book value of shares on the day of the news announcement. *Buy-and-Hold 120 pre* is a buy-and-hold return on the stock measured over 120 trading days ending 31 calendar days before the news announcement. *Multiple News* is an indicator variable that equals one if there was more than one news announcement by the company on a given day, and it equals zero otherwise. |*CAR*| (*CAR*^{2}) is the absolute value (the square) of *CAR News [0,+1]*, as defined above. All data are either directly sourced from or calculated on the basis of raw data collected from Datastream. The model is run separately for good and bad news. It allows us to address the possible

asymmetry of incentives and disincentives of trading on positive and negative private information.

Coefficients β_5 and β_6 are the main coefficients of interest. Assuming that insiders know the information content of the disclosure and can predict how the market will react when the disclosure is made, their strategic trading on this information will be reflected in the link between the probability of trading and *CAR*. We expect that the trade-off between incentives to capitalize on private information about the forthcoming disclosure and disincentives created by the risks of regulatory scrutiny will imply non-linear relation between trading and *CAR* and hence significant coefficients β_5 and β_6. Positive β_5 (the coefficient of $|CAR|$) would reflect incentives to profit from the foreknowledge and a higher probability of insider trading before the disclosure with the larger magnitude of market reaction. Negative β_6 (CAR^2) would reflect that the propensity to trade on the forthcoming disclosure is reduced for news with the large market impact and hence more likely to attract regulatory attention. The strategic trading around news announcements can be further reflected in relationship between probability of trading and the intensity of information flow on the market. The intensity of information flow is proxied by the variable *Multiple News*. Positive coefficient β_4 would be interpreted as evidence of higher propensity to trade before the arrival of several news items on a given day, while the negative coefficient would reflect that insiders tend not to trade before extensive disclosure. We assume that trading before days with several news items disclosed would be in line with trading driven by incentives to trade on private information, while lower propensity to trade then could be driven by disincentives created by greater risk of regulatory scrutiny expected when the information flow is intensive. As the sign of the coefficient depends on whether either incentives or disincentives are relatively stronger in our trade-off consideration, we have no prior expectations regarding β_4 in estimations on the sample of good news. Following arguments of asymmetric risk of regulatory scrutiny with regard to trading before good and bad news (Cheng and Lo 2006), we expect that the disincentives to trade profitably on private information before bad news are relatively stronger than for trading before good news. Consequently, in logit models estimated for bad news we expect the effects of disincentives to be more pronounced. They would be reflected in a noticeable reduction in the propensity to trade on news carrying extreme market reactions captured by a significantly negative coefficient β_6 (the coefficient of CAR^2) and also lower probability of insider trading before days with multiple news announcements captured by a negative coefficient β_4 (the coefficient of *Multiple News*).

In all logit models we control for the firm's size, market-to-book ratio and prior stock return. (Seyhun 1986) finds that the value of stock trades by insiders in negatively related to firm size. On the other hand, insider transactions can be associated with portfolio rebalancing needs if insiders have large stock and stock option holdings, and the holdings are positively correlated with firm size (Huddart *et al.* 2006). Therefore we have no prior expectations regarding the sign of β_1. By including *Market-to-Book* and *Buy-and-Hold 120 pre* we control for well-documented insiders' contrarian behavior (Seyhun 1992; Rozeff and Zaman 1998). Prior literature finds that insiders tend to buy stocks after weak past stock price performance and sell after good performance, and similarly insider trading patterns change across market-to-book groups. Insiders tend to sell glamour (high MB) firms and buy value (low MB) firms (Jenter, 2005). Based on those finding we expect the coefficients β_2 and β_3 to be negative in our regressions on the sample of good news, as the probability of buying is expected to decrease when the market-to-book ratio and past returns increase. In contrast, β_2 and β_3 are expected to be positive in the sample of bad news, as the propensity to sell is expected to increase for high market-to-book stocks and stocks with strong past performance.

4. Empirical results

4.1. Descriptive statistics and univariate analysis

Table 1 provides descriptive statistics of our sample and first evidence on insider trading behavior before regulatory news announcements. The average magnitude of the market reaction to announcements is similar for good and bad news, with the mean of 3.7% for good news and -3.6% for bad news. While there is no clear difference in the size of firms announcing good and bad news, firms that release news that trigger positive market reaction have weaker past performance and lower market-to-book ratio. There is a visible difference in the amount of insider trading before the release of good and bad news. In both absolute and relative terms, there are much more cases of insider trading in the direction consistent with the information content of the news when the news is bad. Furthermore, it is worth noting that while insiders adhere to the trading ban before announcement of earnings news and there are few cases (39 out of 1,733 events) of net buying before positive earnings announcements, before 381 out of 1,707 (22.32%) announcements of bad earnings news insiders were net sellers. The striking finding may be a result of the Model Code clauses, as outlined in Section 2, that allow insiders to get a permission to sell, but not to buy, in the banned period if the trade is driven by non-information, for example liquidity, reasons. Interestingly, the negative earnings announcements before which insiders are net sellers have significantly lower (more

negative) returns than negative earnings news not preceded by insider trading. This suggests that insiders may be using their foreknowledge of the announcement to trade profitably. In contrast, the few good earnings news that are preceded by insider trading have slightly lower, though insignificantly, returns than good earnings announcement without insider trading. Generally, our findings on all types of bad and good news reveal that insiders trade before news with the larger market impact in the group of bad news. The mean (median) *CAR* for bad news preceded by insider trading is -4.1% (-1.9%), which is significantly different at the 0.01 significance level from the mean (median) *CAR* for news without insider trading equal to -3.5% (-1.6%). Insider trading before good news announcement is rather concentrated before announcements with lower information content and lower market reaction. Positive news preceded by insider trading trigger, on average, market reaction of 3.5%, while the mean *CAR* for good news without insider trading is 3.7% (the difference significant at the 0.05 level). The result is somewhat in contrast to our expectations that insiders may be more cautious when trading before bad news announcements due to the asymmetric effect of good and bad news on wealth on outside investors. One of the reasons for the tendency we observe may be the fact that it is easier for insiders to justify their selling in contrast to buying with liquidity and non-information reasons for trading. Nevertheless, the finding that selling is more likely before news with the stronger market reaction is striking. Possible non-linear relation between the propensity to trade on private information and the market impact of the information is addressed in the regression analysis. The univariate analysis of differences in other characteristics is largely in line with our expectations. We confirm the contrarian insiders' behavior and find that insider trading in the good news subsample (net buying) is concentrated in stocks with weaker past performance and lower market-to-book ratio, while insider trading in the group of bad news (net selling) is observed in stocks with higher prior returns and higher book-to-marker ratio. For both good and bad news we find more insider trading in larger stocks, possibly driven by different stock and stock option holdings and different design of the compensation package across size groups. The possible interrelations between the variables are controlled for in the regression analysis.

In Table 2 we shed more light on the distribution of news across specific news categories, their mean and median *CAR* and the extent of insider trading before announcement of news across the categories. The news is evenly distributed between good and bad news subsamples, and the distribution of news across specific news categories is similar in good and bad news groups. *Miscellaneous* is the largest category, followed by *Ownership* and *Restructuring* news. Not surprisingly, *Earnings* are the most price sensitive announcement

triggering on average 5.9% abnormal return for good news and -7.6% abnormal return if the news is negative. As outlined above, a larger proportion of bad news is preceded by insider trading compared to good news and this holds across all specific news categories. The analysis of the link between the proportion of news preceded by insider trading and the average market reaction reinforces our conclusions from Table 1. Three news categories with the smallest market reaction in the good news subsample (*Capital Structure, Ownership* and *Board Changes*) have the largest proportion of news releases preceded by insider trading suggesting that insiders tend to be net buyers before news with smaller information content. On the other hand, in the bad news group the largest proportion of news preceded by insider trading is observed in categories with the largest average market reaction (*Earnings* and *Other Results and Dividends*). Furthermore, across all news categories in the bad news group insider trading is concentrated before announcements with larger absolute value of the market reaction, with either or both mean and median *CAR* being significantly different for news preceded by insider trading and news without insider trading. The findings for good news are more ambiguous. While on average for all announcements *CAR* for news preceded by insider trading are lower than for news without insider trading, the relation differs across specific categories. Before *Ownership* news insider trading is concentrated in releases with higher market impact, and the tendency is reverted for *Other Results and Dividends* and *General Business Info*, where we observe insider trading before announcements triggering a smaller market reaction.

4.2. Regression analysis

Tables 3 and 4 provide result of the logit regressions as denoted by formula (1). Both tables report two panels. Panel A presents coefficients of regressions run on all news announcements (separately good and bad) available in our news database. They include every observation, and multiple news announcements made by the firm on the same day are all included individually. Panel B present coefficient of regressions with multiple news announcement on a given day by the same firm being treated as one observation (as also presented in Tables 1 and 2).

The results reported in Table 3 suggest that insiders do not buy strategically using foreknowledge of the information content of the disclosure before good news announcements. The coefficients estimated in the regressions run on all news, without dividing them into sub-categories, show that there is no relation between the information content of the announcement measured by *CAR* and the propensity to trade. When we divide the news into

news associated with explicitly defined trading ban periods and news without explicit trading ban periods, we find that insiders refrain from trading in ban periods as the information content of the releases increases (negative coefficient of $|CAR|$) but the effect of the legal disincentives of trading on private information somewhat diminishes as the news becomes extreme (positive coefficient of CAR^2). It is worth noting however that there are few observations with insider trading in the *Banned* category of good news, and the findings have to be interpreted with caution. In the *Not Banned* category, where the decision to trade depends more on managers' interpretation of the news, we find some evidence of the increasing propensity to trade as the market impact of the news increases (positive coefficient of $|CAR|$ reported in Panel B of Table 3). The trade-off between incentives to capitalize on foreknowledge and disincentives created by the risk of regulatory scrutiny is clearly reflected in strategic trading before bad news. In full sample and in sub-samples of *Banned* and *Not Banned* news the estimated coefficient of $|CAR|$ is highly significant and positive and the coefficient of CAR^2 is highly significant and negative. The findings give a fuller understanding of the insider selling before negative news announcements in light of findings from the univariate analysis. Here we uncover that indeed insiders' propensity to trade profitably before the announcement increases as the information content of the news increases, as reflected in the positive coefficient of $|CAR|$, but it does so in the non-linear way. As the market reaction when the news is released becomes very large, the potential risks of regulatory scrutiny increase and the insiders' propensity to trade on the information starts to level off.

More light is shed on the strategic insider trading in the analysis of specific news categories presented in Table 4. The table allows us to investigate whether the behavior depends on the news type and which news categories drive our results on more aggregate level presented in Table 3. Similarly to the univariate analysis, findings in the good news subsample are mixed across the news categories, possibly leading to insignificant relationship between the probability of insider trading and *CAR* reported in the first specification in Table 3. No matter how the observation set is defined (Panels A or B), we find that in the *Earnings* and *Other Results and Dividends* groups the relation is non-linear, and the propensity to trade decreases (negative coefficient of $|CAR|$), but at the diminishing pace (positive coefficient of CAR^2) as the price impact of the information increases. In contrast, the opposite behavior is found for *Capital Structure* and *Ownership* news. We find that insiders tend to trade more as the information content of the news goes up, but the propensity to trade decreases as the news becomes extreme. Finding in other types of news are ambiguous. In the bad news group, in

the majority of cases (in all cases reported in Panel A and in six out of eight cases reported in Panel B when multiple news announcements on a given day are treated as one observation) the estimated coefficient of |*CAR*| is positive and significant at the at least 0.10 level. It suggests profitable insider trading across the range of news types, with some exceptions for *Restructuring* and *General Business Info* news. More interestingly, the non-linear characteristics observed in the full sample are mainly driven by *Earnings*, *Other Results and Dividends* and *Board Changes* news. It further supports the arguments of the impact of regulatory and legal risks on the trading behavior, since *Earnings* and *Other Results and Dividends* are by far the most price-sensitive disclosures as reflected by high average *CAR* around announcements reported in Table 2, and as it is generally accepted that they attract high investors interest and media attention. The risks to be accused of insider trading are high then. The coefficients of the control variables, *Size*, *Market-to-Book* and *Buy-and-Hold 120 pre* across all model specifications support the findings of the univariate analysis. Insiders are contrarians and their propensity to buy (sell) decreases (increases) as the past returns and market-to-book ratio increase. The regression results confirm also our earlier findings of more intense insider trading in larger firms.

5. Conclusions

In this paper we analyze strategic trading of insiders and the ways insiders use short-lived private information. We argue that the decisions to trade or not to trade on foreknowledge of corporate news in short windows directly preceding the news announcements is likely to be taken strategically and will result from a trade-off between the incentives to capitalize on foreknowledge of the information content of the disclosure and the disincentives created by risk of the regulatory scrutiny. We assume that insiders know the information content of the upcoming disclosure and can predict how the market will react when the disclosure is made. The more relevant the information released to the market, the larger is the profit that an insider can make by trading on this information. However, the jeopardy of a potential regulatory action against the insider is expected to be higher if the forthcoming news release is highly price-sensitive and consequently this may prevent the insider from trading.

We investigate insider trading around universe of regulatory news announcement in U.K. listed companies included in the FTSE All Share Index between January 1999 and December 2002. Our results show that insider trading is more intense before bad than before good news announcements across all types of news specific categories. Furthermore insider

trading before bad news announcements is concentrated more before news with high market impact, whereas insider trading before good news is related to less price sensitive news. The analysis of trading ban periods reveals that insiders refrain from trading before good news in ban periods, however the legal disincentive diminishes with an increase in market impact of the news. The trade-off between incentives to capitalize on foreknowledge and disincentives created by the risk of regulatory scrutiny is clearly reflected in strategic trading before bad news. We show that insiders' propensity to trade profitably before bad news increases as the information content of the news increases, but as the market reaction to the news becomes very large, the potential risks of regulatory scrutiny increase and the insiders' propensity to trade on the information starts to smooth out. When we consider specific news categories we find out that the results are ambiguous for good news where propensity to trade before *Earnings, Other Results and Dividends* and *Restructuring* decreases but at a diminishing pace as the news becomes more extreme. For Ownership and Capital Structure the observed trend of likelihood of insider trading before good news is similar to the trend observed for *Earnings Other Results and Dividends* and *Board Changes* before bad news and supports the argument that there is a trade-off between the incentive to capitalize on foreknowledge of the information content and the disincentive created by legal scrutiny.

There are several questions and issues that remain unanswered. Throughout the analysis we assume that the market reaction to the news, *CAR*, is exogenous and is an unbiased measure of the information content of the announcement. However, it can be argued that the insider trading before the disclosure reveals some information contained in still undisclosed news and hence the market reaction to insider trading preempts some of the information content of the news disclosure. As a result, *CAR* would to some extent be determined by prior insider trading and, looking from the perspective of this paper, insider trading could be then observed before news with the lower market impact. The effect of this issue on our results is unclear. By and large, such reversed causality, if indeed existent, would weaken the relationship we want to observe. It may be the case of our good news subsample, where we find that on average insiders trade before news that trigger a weaker market reaction. On the other hand, we may be even underestimating the effects we observe in the bad news groups. If insider trading preempts some of the information content of the subsequent release, the true relationship and the true effect of the incentives to capitalize on private information may be even stronger from the one we measure. Further, we treat the timing of news announcements as exogenous and we analyze whether insiders strategically trade before the announcements. It may be however argued that managers have some discretion regarding the timing of

announcements and can strategically manipulate both trading and news releases (Cheng and Lo 2006). We leave these issues open for further research.

References

Bettis, J.C., Coles, J.L., Lemmon, M.L., 2000. Corporate policies restricting trading by insiders. Journal of Financial Economics 57, 191-220

Bhattacharya, U., Daouk, H., 2002. The world price of insider trading. Journal of Finance 57, 75-108

Cheng, Q., Lo, K., 2006. Insider trading and voluntary disclosures. Journal of Accounting Research Forthcoming

Finnerty, J.E., 1976. Insiders and market efficiency. Journal of Finance 31, 1141-1148

Friederich, S., Gregory, A., Matatko, J., Tonks, I., 2002. Short-run returns around the trades of corporate insiders on the London Stock Exchange. European Financial Management 8, 7-30

Givoly, D., Palmon, D., 1985. Insider trading and the exploitation of inside information - Some empirical-evidence. Journal of Business 58, 69-87

Gregory, A., Matatko, J., Tonks, I., 1997. Detecting information from directors' trades: signal definition and variable size effects. Journal of Business Finance and Accounting 24, 309-342

Gregory, A., Matatko, J., Tonks, I., Purkis, R., 1994. UK directors trading - the impact of dealings in smaller firms. Economic Journal 104, 37-53

Hirschey, M., Zaima, J.K., 1989. Insider Trading, Ownership Structure, and the Market Assessment of Corporate Sell-Offs. Journal of Finance 44, 971-980

Huddart, S., Ke, B., Shi, C., 2006. Jeopardy, non-public information, and insider trading around SEC 10-K and 10-Q filings. Journal of Accounting and Economics forthcoming

Jaffe, J.F., 1974. Special Information and Insider Trading. Journal of Business 47, 410-428

Jeng, J.L., Metrick, A., Zeckhauser, R., 2006?, Estimating the returns to insider trading: A performance-evaluation perspective. Review of Economics and Statistics 85, 453-471

John, K., Lang, L.H.P., 1991. Insider trading around dividend announcements - Theory and evidence. Journal of Finance 46, 1361-1389

John, K., Narayanan, R., 1997. Market manipulation and the role of insider trading regulations. Journal of Business 70, 217-247

Karpoff, J.M., Lee, D.S., 1991. Insider trading before new issue announcements. Financial Management 20, 18-26

Ke, B., Huddart, S., Petroni, K., 2003. What insiders know about future earnings and how they use it: Evidence from insider trades. Journal of Accounting and Economics 35, 315-346

Kyle, A.S., 1985. Continuous auctions and insider trading. Econometrica 53, 1315-1335

Lamba, A.S., Khan, W.A., 1999. Exchange listings and delistings: The role of insider information and insider trading. Journal of Financial Research 22, 131-146

Lee, D.S., Mikkelson, W.H., Partch, M.M., 1992. Managers trading around stock repurchases. Journal of Finance 47, 1947-1961

Manne, H.G., 1966. Insider trading and stock market. Free Press

Meulbroek, L.K., 1992. An empirical-analysis of illegal insider trading. Journal of Finance 47, 1661-1699

Noe, C.F., 1999. Voluntary disclosures and insider transactions. Journal of Accounting and Economics 27, 305-326

Penman, S.H., 1982. Insider trading and the dissemination of firms forecast information. Journal of Business 55, 479-503

Piotroski, J.D., Roulstone, D.T., 2005. Do insider trades reflect both contrarian beliefs and superior knowledge about future cash flow realizations? Journal of Accounting and Economics 39, 58-81

Pope, P., Morris, R., Peel, D., 1990. Insider trading: Some evidence on market efficiency and directors's share delings in Great Britain. Journal of Business Finance and Accounting 17, 359-380

Rozeff, M.S., Zaman, M.A., 1998. Overreaction and insider trading: Evidence from growth and value portfolios. Journal of Finance 53, 701-716

Seyhun, H.N., 1986. Insiders profits, costs of trading, and market-efficiency. Journal of Financial Economics 16, 189-212

Seyhun, H.N., 1990a. Do bidder managers knowingly pay too much for target firms. Journal of Business 63, 439-464

Seyhun, H.N., 1990b. Overreaction or fundamentals - Some lessons from insiders response to the market crash of 1987. Journal of Finance 45, 1363-1388

Seyhun, H.N., 1992. Why does aggregate insider trading predict future stock returns. Quarterly Journal of Economics 107, 1303-1331

Seyhun, H.N., Bradley, M., 1997. Corporate bankruptcy and insider trading. Journal of Business 70, 189-216

Table 1. Descriptive statistics of news announcements

This table presents the descriptive statistics of news announcements in our sample. Panel A presents results for Good News. Good News is an announcement that yields non-negative *CAR News [0,+1]*. In the subsample of Good News, an announcement is associated with insider trading if there is a positive net amount of shares bought within 30 calendar days before the announcement (News Preceded by Insider Trading). Panel B presents results for Bad News. Bad News is an announcement that yields negative *CAR News [0,+1]*. In the subsample of Bad News, an announcement is associated with insider trading if there is a net amount of shares sold within 30 calendar days before the announcement (News Preceded by Insider Trading). *Banned (Not Banned)* news are news associated (not associated) with trading ban periods. *CAR News [0,+1]* is the event period abnormal returns. CARs are market model adjusted. Coefficients of the market model are estimated over 260 trading days ending 31 calendar days before the news announcement. *Buy-and-Hold 120 pre* is buy-and-hold return on the stock measured over 120 trading days ending 31 calendar days before the news announcement. *Size* is the natural logarithm of the firm's market capitalization measured on the day of the news announcement. *Market-to-Book* is the ratio of the market value of shares and book value of shares on the day of the news announcement. Differences between samples of News Preceded by Insider Trading and News without Insider Trading are performed using T-test for differences in means and Wilcoxon Two-Sample Test for differences in medians and presented in the last two columns. ***, **,* Denote differences between news classified as Banned and Not Banned within God News (Bad News) category at 0.01, 0.05 and 0.1 level, respectively. ^{a,b,c} Denotes the differences between Banned news across Good and Bad News, and the differences between Not Banned news cross Good and Bad News at 0.01, 0.05 and 0.1 level, respectively.

	Full Sample			News Preceded by Insider Trading			News without Insider Trading			T-test (p-value)	Wilcoxon Two-Sample Test (p-value)
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median
Panel A. **Good News**											
All - Number of Observations	39,617			4,083			35,534				
CAR News (0,+1)	0.037^{a}	0.018^{a}	0.060	0.035^{a}	0.019^{a}	0.051	0.037^{a}	0.018^{a}	0.060	0.011	0.164
Buy-and-Hold 120 pre	0.030^{a}	-0.020^{a}	0.578	-0.057^{a}	-0.079^{a}	0.465	0.038^{a}	-0.012^{a}	0.589	0.000	0.000
Size	3,381	224^{a}	14,122	5,606	409^{b}	20,517	3,126	211^{a}	13,166	0.000	0.000
Market-to-Book	3.170^{a}	1.880^{a}	16.535	1.282^{a}	1.690^{a}	18.305	3.387	1.910^{a}	16.306	0.000	0.000
Banned - Number of Observations	1,733			39			1,694				
CAR News (0,+1)	0.059^{***,a}	0.037^{***,a}	0.069	0.052^{*,a}	0.032^{***,a}	0.057	0.059^{***,a}	0.037^{***,a}	0.069	0.526	0.649
Buy-and-Hold 120 pre	0.024	0.000**	0.430	0.022	0.045**	0.315	0.024	0.000	0.433	0.961	0.694
Size	2,621***	145***	12,091	3,740**	2,446^{**,a}	4,321	2,596*	142^{***,c}	12,211	0.134	0.000
Market-to-Book	3.465	1.850	9.866	1.931^{a}	1.790	3.636	3.501	1.850	9.962	0.016	0.597
Not Banned - Number of Observations	37,884			4,044			33,840				
CAR News (0,+1)	0.036^{a}	0.018^{a}	0.059	0.035^{a}	0.019^{a}	0.050	0.036^{a}	0.018^{a}	0.060	0.153	0.008
Buy-and-Hold 120 pre	0.028^{a}	-0.021^{a}	0.584	-0.057^{a}	-0.080^{a}	0.466	0.038^{a}	-0.013^{a}	0.595	0.000	0.000
Size	3,417	229^{a}	14,207	5,624	407^{a}	20,611	3,153	217^{a}	13,211	0.000	0.000
Market-to-Book	3.157^{a}	1.880^{a}	16.777	1.275^{a}	1.690^{a}	18.390	3.382	1.910^{a}	16.560	0.000	0.000

Table 1. Descriptive statistics of news announcements – continued

	Full Sample			News Preceded by Insider Trading			News without Insider Trading			T-test (p-value)	Wilcoxon Two-Sample Test (p-value)
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median
Panel B. **Bad News**											
All - Number of Observations	38,634			6,218			32,416				
CAR News (0,+1)	-0.036	-0.016	0.075	-0.041	-0.019	0.083	-0.035	-0.016	0.073	0.000	0.000
Buy-and-Hold 120 pre	0.114	0.030	0.705	0.154	0.045	0.830	0.106	0.027	0.678	0.000	0.000
Size	3,487	261	14,495	5,269	408	18,933	3,145	239	13,451	0.000	0.000
Market-to-Book	3.630	2.040	14.292	4.046	2.330	11.878	3.550	1.980	14.708	0.004	0.000
Banned - Number of Observations	1,707			381			1,326				
CAR News (0,+1)	-0.076***	-0.043***	0.112	-0.101***	-0.053***	0.148	-0.069***	-0.040***	0.098	0.000	0.000
Buy-and-Hold 120 pre	0.043***	-0.010***	0.643	0.026***	-0.022***	0.544	0.048***	-0.005***	0.669	0.511	0.467
Size	2,474***	138***	11,445	3,224***	217***	13,136	2,259***	121***	10,907	0.191	0.000
Market-to-Book	3.616	1.970**	11.128	4.173	2.040	7.026	3.456	1.940**	12.048	0.143	0.011
Not Banned - Number of Observations	36,927			5,837			31,090				
CAR News (0,+1)	-0.034	-0.016	0.072	-0.044	-0.018	0.075	-0.033	-0.015	0.072	0.000	0.000
Buy-and-Hold 120 pre	0.117	0.032	0.707	0.162	0.050	0.845	0.109	0.029	0.678	0.000	0.000
Size	3,535	269	14,620	5,403	426	19,245	3,183	246	13,548	0.000	0.000
Market-to-Book	3.630	2.040	14.421	4.038	2.350	12.128	3.554	1.980	14.811	0.007	0.000

Table 2. Descriptive statistics of CAR News [0,+1]

This table presents the descriptive statistics of *CAR News [0,+1]*, the event period abnormal returns of news announcements. Panel A presents results for Good News. Good News is an announcement that yields non-negative *CAR News [0,+1]*. In the subsample of Good News, an announcement is associated with insider trading if there is a positive net amount of shares bought within 30 calendar days before the announcement (News Preceded by Insider Trading). Panel B presents results for Bad News. Bad News is an announcement that yields negative *CAR News [0,+1]*. In the subsample of Bad News, an announcement is associated with insider trading if there is a net amount of shares sold within 30 calendar days before the announcement (News Preceded by Insider Trading). CARs are market model adjusted. Coefficients of the market model are estimated over 260 trading days ending 31 calendar days before the news announcement. Differences between News Preceded by Insider Trading and News without Insider Trading are presented using T-test for differences in means and Wilcoxon Two-Sample Test for differences in medians. The number of all observations is not equal to the sum of single categories number of observations, because there may be more than one news announcement on a given day. In the All category we consider one observation per day to avoid double counting the abnormal returns.

	Full Sample				News Preceded by Insider Trading					News without Insider Trading				T-test (p-value)	Wilcoxon Two-Sample Test (p-value)
	N	Mean	Median	Std. Dev.	N	% All	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	Mean	Median
Panel A. **Good News**															
All	39,617	0.037	0.018	0.060	4,083	10.31%	0.034	0.019	0.051	35,534	0.037	0.018	0.060	0.011	0.164
Earnings	1,733	0.059	0.037	0.069	39	2.25%	0.052	0.032	0.057	1,694	0.059	0.037	0.069	0.526	0.649
Other Results and Div	4,590	0.050	0.029	0.063	348	7.58%	0.041	0.024	0.062	4,242	0.050	0.030	0.063	0.006	0.000
Capital Structure	4,593	0.029	0.016	0.049	720	15.68%	0.029	0.016	0.041	3,873	0.029	0.016	0.050	0.849	0.226
Restructuring	7,552	0.036	0.017	0.061	589	7.80%	0.035	0.021	0.054	6,963	0.036	0.017	0.061	0.821	0.009
Ownership	9,949	0.032	0.016	0.048	1,268	12.74%	0.035	0.018	0.050	8,681	0.031	0.016	0.048	0.026	0.001
Board Changes	1,906	0.033	0.016	0.048	218	11.12%	0.031	0.016	0.041	1,688	0.033	0.016	0.049	0.507	0.968
General Business Info	4,369	0.052	0.029	0.076	429	9.82%	0.045	0.026	0.064	3,877	0.053	0.029	0.077	0.017	0.022
Miscellaneous	11,893	0.035	0.016	0.067	922	7.75%	0.035	0.020	0.054	10,971	0.035	0.016	0.068	0.712	0.001
Panel B. **Bad News**															
All	38,634	-0.036	-0.016	0.075	6,218	16.09%	-0.041	-0.019	0.083	32,416	-0.035	-0.016	0.073	0.000	0.000
Earnings	1,707	-0.076	-0.043	0.112	381	22.32%	-0.101	-0.053	0.148	1,326	-0.069	-0.040	0.098	0.000	0.000
Other Results and Div	4,339	-0.073	-0.030	0.130	933	21.50%	-0.083	-0.032	0.140	3,406	-0.070	-0.029	0.126	0.011	0.010
Capital Structure	4,724	-0.027	-0.015	0.051	812	17.19%	-0.031	-0.018	0.070	3,912	-0.026	-0.015	0.046	0.031	0.000
Restructuring	7,318	-0.031	-0.014	0.073	990	13.53%	-0.030	-0.018	0.048	6,328	-0.031	-0.013	0.077	0.825	0.000
Ownership	10,189	-0.025	-0.014	0.040	1,623	15.93%	-0.027	-0.015	0.043	8,566	0,025	-0.014	0.040	0.107	0.028
Board Changes	1,763	-0.035	-0.016	0.069	329	18.66%	-0.035	-0.018	0.046	1,434	-0.035	-0.016	0.074	0.976	0.030
General Business Info	3,316	-0.047	-0.023	0.102	530	15.98%	-0.052	-0.027	0.095	2,786	-0.046	-0.022	0.103	0.200	0.003
Miscellaneous	12,112	-0.033	-0.015	0.076	1,669	13.78%	-0.037	-0.017	0.075	10,443	-0.033	-0.015	0.076	0.049	0.000

Table 3. Analysis of Insider Trading Bans around News Announcements – Logit Regressions

This table presents estimated coefficients of the logistic regressions to explain the probability that insiders buy (sell) stock within 30 calendar days before good (bad) news announcements. First, we present the results for all either good or bad news. Second, we divided each subsample according to trading bans imposed *(Banned, Not Banned)* and analyze the effect of trading bans on the likelihood of insider trading. Good News is an announcement that yields non-negative *CAR News [0,+1]*. In the subsample of Good News announcements the dependent variable equals one if there is a positive net amount of shares bought within 30 calendar days before the announcement and zero otherwise. Bad News is an announcement that yields negative *CAR News [0,+1]*. In the subsample of Bad News announcements the dependent variable equals one if there is a net amount of shares sold within 30 calendar days and zero otherwise. *Size* is the natural logarithm of the firm's market capitalization measured on the day of the news announcement. *Market-to-Book* is the ratio of the market value of shares and book value of shares on the day of the news announcement. *Buy-and-Hold 120 pre* is buy-and-hold return on the stock measured over 120 trading days ending 31 calendar days before the news announcement. |*CAR*| *News* is the absolute value of event period abnormal returns. |*CAR*| *Banned* (|*CAR*| *Not Banned)* is the event period abnormal returns of the news in a group of *Banned (Not Banned)* News. CARs are market model adjusted. Coefficients of the market model are estimated over 260 trading days ending 31 calendar days before the news announcement. Standard deviation is reported in parenthesis. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

	Good News				Bad News			
Panel A. **IT up to 30 days prior to news release – multiple news announcement**								
Constant	-2.996***	(0.047)	-2.994***	(0.047)	-2.751***	(0.039)	-2.754***	(0.039)
Size	0.150***	(0.007)	0.147***	(0.007)	0.163***	(0.006)	0.168***	(0.006)
Market-to-Book	-0.011***	(0.001)	-0.011***	(0.001)	0.004***	(0.001)	0.004***	(0.001)
Buy-and-Hold 120pre	-0.637***	(0.042)	-0.639***	(0.042)	0.030*	(0.016)	0.039**	(0.016)
Multiple News	-0.716***	(0.034)	-0.666***	(0.034)	-0.304***	(0.025)	-0.350***	(0.025)
|CAR| News	-0.130	(0.417)			4.065***	(0.274)		
CAR^2 News	-0.243	(0.841)			-2.871***	(0.381)		
|CAR| Banned			-20.810***	(2.607)			6.106***	(0.545)
CAR^2 Banned			23.378***	(4.535)			-3.630***	(0.854)
|CAR| Not Banned			0.660	(0.449)			3.159***	(0.296)
CAR^2 Not Banned			-1.151	(1.035)			-2.397***	(0.429)
N	60,090		60,090		59,089		59,089	
Pseudo R^2	0.041		0.045		0.031		0.035	
Panel B. **IT up to 30 days prior to news release – single news announcement**								
Constant	-3.022***	(0.054)	-3.022***	(0.054)	-2.593***	(0.047)	-2.596***	(0.046)
Size	0.156***	(0.008)	0.154***	(0.008)	0.143***	(0.007)	0.146***	(0.007)
Market-to-Book	-0.006***	(0.001)	-0.006***	(0.001)	0.002*	(0.001)	0.002*	(0.001)
Buy-and-Hold 120pre	-0.609***	(0.048)	-0.610***	(0.047)	0.064***	(0.017)	0.070***	(0.018)
Multiple News	-0.502***	(0.052)	-0.424***	(0.053)	-0.221***	(0.040)	-0.280***	(0.040)
|CAR| News	0.490	(0.531)			3.009***	(0.321)		
CAR^2 News	-1.247	(1.324)			-1.786***	(0.418)		
|CAR| Banned			-21.545***	(3.418)			5.804***	(0.689)
CAR^2 Banned			23.671***	(5.437)			-3.537***	(1.055)
|CAR| Not Banned			1.206**	(0.556)			2.355***	(0.333)
CAR^2 Not Banned			-2.237	(1.483)			-1.380***	(0.432)
N	36,617		36,617		38,634		38,634	
Pseudo R^2	0.033		0.038		0.023		0.026	

Table 4. Analysis of the Likelihood of Insider Trading around Different Categories of News Announcements – Logit Regressions

This table presents estimated coefficients of the logistic regressions to explain the probability that insiders buy (sell) stock within 30 calendar days before good (bad) news announcements. The analysis of the likelihood of insider trading before news announcement is provided across different categories of news announcements (*Earnings, Other Results and Dividends, Capital Structure, Restructuring, Ownership, Board Changes, General Business Information and Miscellaneous)*. Good News of any category is an announcement that yields non-negative *CAR News [0,+1]*. In the subsample of good news announcements the dependent variable equals one if there is a positive net amount of shares bought within 30 calendar days before the announcement and zero otherwise. Bad News of any category is an announcement that yields negative *CAR News [0,+1]*. In the subsample of bad news announcements the dependent variable equals one if there is a net amount of shares sold within 30 calendar days and zero otherwise. *Size* is the natural logarithm of the firm's market capitalization measured on the day of the news announcement. *Market-to-Book* is the ratio of the market value of shares and book value of shares on the day of the news announcement. *ROA* is return on assets based on last reported statements. *Buy-and-Hold 120 pre* is buy-and-hold return on the stock measured over 120 trading days ending 31 calendar days before the news announcement. |*CAR*| *News* is the absolute value of event period abnormal returns. |*CAR*| *Earnings* (|*CAR*| *Other Results and Div*, |*CAR*| *Capital Structure*, |*CAR*| *Restructuring*, |*CAR*| *Ownership*, |*CAR*| *Board Changes*, |*CAR*| *General Business Info*, |*CAR*| *Miscellaneous)* is the event period abnormal returns of the news in a group *of Earnings (Other Results and Div, Capital Structure, Restructuring, Ownership, Board Changes, General Business Info, and Miscellaneous)*. CARs are market model adjusted. Coefficients of the market model are estimated over 260 trading days ending 31 calendar days before the news announcement. Standard deviation is reported in parenthesis. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

	Good News		Bad News	
Panel A. **IT up to 30 days prior to news release – multiple news announcement**				
Constant	-3.032***	(0.048)	-2.768***	(0.040)
Size	0.147***	(0.007)	0.167***	(0.006)
Market-to-Book	-0.011***	(0.001)	0.004***	(0.001)
Buy-and-Hold 120 pre	-0.612***	(0.042)	0.046***	(0.016)
Multiple News	-0.606***	(0.035)	-0.295***	(0.025)
|CAR| Earnings	-19.686***	(3.156)	7.363***	(0.620)
CAR^2 Earnings	21.642***	(5.276)	-4.322***	(0.868)
|CAR| Other Results and Div	-7.071***	(1.120)	6.629***	(0.514)
CAR^2 Other Results and Div	9.268***	(2.029)	-6.427***	(0.936)
|CAR| Capital Structure	10.455***	(1.469)	3.395***	(0.874)
CAR^2 Capital Structure	-23.266***	(7.325)	-1.115	(0.946)
|CAR| Restructuring	-4.373***	(0.911)	2.423***	(0.710)
CAR^2 Restructuring	4.699***	(1.439)	-3.643**	(1.803)
|CAR| Ownership	8.249***	(1.042)	3.260***	(0.788)
CAR^2 Ownership	-17.791***	(4.702)	-2.850	(1.764)
|CAR| Board Changes	7.025**	(2.744)	11.727***	(2.160)
CAR^2 Board Changes	-29.439*	(16.058)	-35.915***	(11.670)
|CAR| General Business Info	3.390***	(1.064)	2.247***	(0.728)
CAR^2 General Business Info	-7.170**	(3.572)	-1.388	(0.844)
|CAR| Miscellaneous	-1.660**	(0.693)	1.517***	(0.475)
CAR^2 Miscellaneous	0.984	(0.744)	-0.800	(0.528)
N	60,090		59,089	
Pseudo R^2	0.053		0.036	

Table 4. Analysis of Insider Trading around Different Categories of News Announcements – Logit Regressions - continued

	Good News		Bad News	
Panel B. **IT up to 30 days prior to news release – single news announcement**				
Constant	-3.027***	(0.054)	-2.594***	(0.047)
Size	0.151***	(0.008)	0.148***	(0.007)
Market-to-Book	-0.006***	(0.001)	0.002*	(0.001)
Buy-and-Hold 120 pre	-0.587***	(0.047)	0.079***	(0.018)
Multiple News	-0.389***	(0.056)	-0.314***	(0.043)
|CAR| Earnings	-19.654***	(3.412)	5.660***	(0.717)
CAR^2 Earnings	21.585***	(5.478)	-3.690**	(1.184)
|CAR| Other Results and Div	-3.964***	(1.190)	4.317***	(0.554)
CAR^2 Other Results and Div	6.246**	(2.463)	-3.628***	(0.922)
|CAR| Capital Structure	8.960***	(1.422)	1.635*	(0.970)
CAR^2 Capital Structure	-16.983***	(6.145)	0.230	(1.331)
|CAR| Restructuring	-2.258**	(1.004)	-0.826	(0.936)
CAR^2 Restructuring	3.423*	(1.885)	-0.844	(1.971)
|CAR| Ownership	6.898***	(1.014)	2.314***	(0.834)
CAR^2 Ownership	-12.087***	(4.270)	-2.411	(2.058)
|CAR| Board Changes	5.684**	(2.732)	9.152***	(2.158)
CAR^2 Board Changes	-24.998	(15.760)	-31.889***	(11.377)
|CAR| General Business Info	1.030	(1.039)	0.954	(0.787)
CAR^2 General Business Info	-1.941	(2.838)	-0.412	(0.981)
|CAR| Miscellaneous	-1.619**	(0.759)	0.851*	(0.499)
CAR^2 Miscellaneous	0.717	(1.000)	-0.256	(0.424)
N	36,617		38,634	
Pseudo R^2	0.045		0.029	

Appendix A – **News Classification**

News Category	News Items
Earnings	Preliminary Annual Results
	Interim Results
	Quarterly Results
Other Results and dividends	Final Results
	Operating Reports
	Trading Statements
	Dividends
Capital Structure	Equity Issue
	Debt Issue
	Transactions in Own Shares
	Blocklisting Interim Review
	Script Dividends
	Debt
	Other Capital Structure
Restructuring	Mergers and Acquisitions
	Demergers
	Expansion of Business
	Disposals
	Interest in Shares
Ownership	Ownership Changes
Board Changes	Board Changes
	Management Appointments
General Business Info	Change of Adviser
	Agreements
	Awards and Cancellations of Contracts
	Regulatory Applications and Approvals
	Patents
	New Products
	Research Updates
	Net Asset Value
	Litigation Issues
	Labour Issues
	Other Business Information
Miscellaneous	Other Appointments
	Listing
	Other
	Observations without a Title

[1] More recently, insider trading bans during pension fund blackout periods were introduced in the U.S. by the Sarbanes-Oxley Act of 2002.

[2] However, in practice insider trading laws are difficult to implement because of the complications in separating insider trading on private information from trading for portfolio changes or liquidity. Bhattacharya and Douk (2002) argue that in many countries the legislation is inefficient as only few legal cases emerged from these rules. We assume that insiders are aware of the legislation and the potential consequences on trading on insider information as in the UK a number of court cases have resulted in significant fines and imprisonments. If insiders trade for non-information reasons, such as, for example liquidity, we expect these trades to be randomly distributed and not necessarily undertaken around news announcements.

[3] This signaling motive, also developed in other transactions such as share repurchases, implies that insiders are able to manipulate their own companies' share prices. (Givoly and Palmon 1985) introduced the idea of the "leading indicator" that allows outside investors to track insiders' trades and to use as a trading strategy. However, this signaling motive applies only for buy trades and is not likely to apply for the sell transactions.

[4] See (Bhattacharya and Daouk 2002) for a summary of insider trading legislations in different countries.

[5] E.g., Jaffe (1974), Finnerty (1976a) (1976b), Pope et al., (1990), Gregory, Matatko, Tonks and Purkis (1994), Gregory et al., (1997), Friederich et al. (2002), Hillier and Marshall (2002).

[6] Note that the description *News without Insider Trading* does not necessary refer to news observations not preceded by any insider transactions. It also refers to good news preceded by net selling and bad news preceded by net buying, as well as to news for which the number of shares purchased and sold over the previous 30 calendar days are equal.