Does Cross-Listing Mitigate Insider Trading?

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ABSTRACT

In this paper we assess the extent to which exposure to two legal regimes and higher reputational risk limit the ability to extract private benefits of control by trading on insider information. We analyze profitability of insider trading in cross-listed compared to domestically listed companies. We use a unique dataset of all insider trading transactions and corporate news announcements in the UK firms over the period 1999-2003. In line with previous evidence we find that insiders are contrarians and the announcement date and post-announcement date abnormal returns are positive in the case of insiders buys and negative for the sells. However, we show that most of the event date and post-event date abnormal performance after insider trading happens in domestically-listed companies. To asses whether insiders in cross-listed companies trade less on private information we analyze corporate news announcement released around insiders' trades and we find that insiders in cross-listed companies are less likely to buy before good news announcements and sell before bad news announcements. Our investigation additionally indicates that the binding effect of exposure to two legal regimes and higher reputational risk is more pronounced in the case of the sell. This results suggest that insiders in cross-listed firms may refrain from selling in anticipation of bad news leaving the uninformed investors in long positions in loosing stocks because of potentially more severe sanctions and reputational risk consequences, while, in the case of purchases, the expropriation is less harmful because insiders and outsiders gain from subsequent increases in stock prices.

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Does Cross-Listing Mitigate Insider Trading?

Previous studies report that corporate insiders trade on private information and outsiders can earn abnormal profits by mimicking these trades.[1] The legality of such trading is widely debated in the literature. Some studies argue that insider trading should be allowed as it increases market efficiency because any private information, related to the news released after the trade, becomes compounded quickly into share prices (e.g., Cornell and Sirri, 1992; Manne, 1966; Meulbroek, 1992; Hu and Noe, 1997). Insider trading can also be beneficial as it allows managers to signal their assessment of the true value of their miss-valued firms and mitigates the motivational problems that interfere with efficient contracting between managers and shareholders (Demsetz, 1986). In contrast, other studies maintain that insider trading should be regulated because such trades are based on private information, leading to an expropriation of uninformed investors. (See Bainbridge, 2002, and Bhattacharya and Daouk, 2002, for a review). In addition, the restriction of insider trading is likely to mitigate any potential private benefit of both insiders and controlling shareholders at the expense of the minority shareholders (Maug, 1999), lower the perceptions of unfair practices, level the playing field for investors, and, as a result, attracts more capital and lowers the cost of capital (e.g., Kyle, 1985). Although these arguments provide support for the current insider trading regulations in many countries, this activity is difficult to regulate because of the complications in defining an insider, the information that is 'price-sensitive', separating insider trading on private information from trading for portfolio changes or liquidity, and the controversies as to whether insider trading is profitable after accounting for transaction costs. As a result, while in many countries a set of laws prohibit insider trading based on private information, they are inefficient as only few legal cases emerged from these rules (Bhattacharya and Douk, 2002).[2]

The purpose of this paper is to contribute to this research by assessing the extent to which insider trading is constrained by the exposure to additional regulations. We test the hypothesis that insiders of cross-listed companies are less likely to trade on private information as they face stricter enforcement regimes because they are subject to two countries' legal requirements. To our knowledge, no previous study has analyzed insider trading in the context of international cross-listing. While recent studies on cross-listing have focused on the governance, and the legal and reputational bonding hypotheses following cross-listing (e.g., Pagano, Roell and Zechner, 2002; Reese and Weisbach, 2002; Doidge, Karolyi and Stulz, 2004; Siegel, 2005), studies on insider trading are mainly concerned with

the effectiveness of domestic legal rules in deterring insiders from trading around particular news releases (e.g., Agrawal and Jaffe, 1995, Seyhun and Bradley, 1997). Our study expands these trends in the literature by comparing the information content of cross-listed versus domestically-listed companies and test the hypothesis that cross-listing mitigates the propensity of insiders to trade before material news is announced. Compared to domestically-listed companies, we expect insider trading in cross-listed companies to be executed for portfolio changes, liquidity or mispricing considerations rather than private information, to comply with the additional restrictions in the foreign country. The analysis of news announcements around insider trading allows us also to separate the two main sources of insiders' superior trading performance, namely their ability to recognize their firms' market mispricing and their private superior knowledge about their firms' future cash flow realizations. In particular, if insiders' trades are driven by their firm's mis-valuation, we expect insiders to be contrarians, i.e., to buy (sell) after significant price declines (increases), but their trades should not occur before releases of material information.

We test these hypotheses by comparing the information content of insider trading in UK companies cross-listed in the US (referred thereafter as cross-listed) to that in UK companies without a US listing (domestically-listed companies). We use a sample of 13,372 insider trading events undertaken in 907 individual companies and 53,515 news announcements made by companies in our sample around insider trading events. We focus on UK cross-listed firms in the US for a number of reasons.[3] First, although the UK and the US markets have relatively similar corporate governance characteristics,[4] the exposure into the two insider trading legal environments is expected to decrease the trading profits of insiders and result in the insider trading activity to be undertaken for other than information purposes. The analysis of the insider trading legal systems in the US and UK, reported in Appendix A, shows that the two systems are complementary and increase insiders' legal potential liability. Second, this exposure also presents an attractive research environment to test the reputational bonding hypothesis (e.g., Siegel, 2005) which implies that managers of UK cross-listed companies will refrain from trading on insider information because they are subject to a higher loss of reputation than UK companies without a US-listing in the event of prosecution. We refer to these two additional exposures as the 'legal and reputational bonding contracts'.[5] Third, since cross-listing in the US decreases the level of information asymmetry and improves the firm's visibility through greater analyst coverage, increased disclosure requirements, a more thorough investor monitoring, better accuracy and increased media attention (e.g., Baker, Nofsinger and Weaver, 2002; Lang, Lins and Miller, 2003, 2004), the

information content of insider trading is likely to be lower in cross-listed compared to domestically-listed companies. Thus, overall, we expect insider trading in cross-listed companies to have lower information content than that in domestically-listed companies.

Consistent with previous evidence (e.g., Seyhun, 1986), our results indicate that insiders adopt contrarian strategies as they buy (sell) shares in their own companies after significant price decline (run up). These trades are also likely to be informative as they result in significant positive (negative) post-event abnormal returns. However, we report significant differences between cross-listed and domestically-listed firms. The results based on the univariate analysis show that the abnormal stock price behavior around insider trading is confined mainly to domestically-listed firms. The information content of insider trading in cross-listed companies is relatively small. However, when we account for size and other differences between the two sets of firms, we find that the market reacts differently to the trades undertaken by cross-listed and domestically-listed companies but we show that the bonding effects apply mainly in the case of the sell trades as the post-event abnormal returns of the cross-listed firms are higher than those of domestically-listed firms. These findings reflect the asymmetric effect of possible expropriation which is likely to be more severe in the case of sales when insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in loosing stocks while the expropriation in the case of purchases is less harmful when both insiders and outsiders gain from favorable post-event price changes.

We also analyse the news released before and after insider trading events. In the pre-event period, we find that, for both sets of companies, insiders buy (sell) after releasing bad (good) news, suggesting that insiders are not likely to trade because they can assess better the value of their company. In the post-event period, we find that insider trading in cross-listed companies contains less information than that of domestically-listed companies, implying that the insiders in cross-listed companies are bonded from trading on price sensitive information. Finally, we find that the probability of buying (selling) before good (bad) news announcements is lower in the case of cross-listed companies. Interestingly, we find that insiders in cross-listed companies are reluctant to trade before news on board changes, earnings and management forecasts. Given that insiders know these types of announcements, the results suggest that insiders are likely to select the news they are willing to trade upon. These findings provide some support for the proposition that cross-listing limits the propensity of insiders to gain personal benefits by trading on private information because of potential exposure and more severe penalties.

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The remainder of the paper is organized as follows. Section I describes the data and the methodology. Section II discusses the results. Section III checks for robustness and the conclusions are in Section IV.

I.   Data and Methodology

A.   Data

We use a large database of directors' dealings spanning from January 1999 to December 2003. The database of directors' dealings is collected from Directors Deals Ltd. and includes news items on directors' trades disclosed by all UK companies to the Regulatory News Service (RNS). We exclude a number of observations that are not likely to be driven by private information, such as exercise of options or derivatives, script dividends, bonus shares, rights issue, awards made to directors under incentive plans or reinvestment plans.[6] We also exclude all directors' transactions in investment companies. This screening has resulted in 13,372 insider trades in 907 listed companies, split into 10,414 (78%) purchases and 2,953 (22%) sells.[7] Our sample period covers two interesting sub-periods: the worldwide boom (January 1999 to March 2000) and bust (April 2000 to December 2003) in the stock markets.

We collect data on news announcements from Perfect Information database as reported in the RNS for companies in our sample. The database includes, in text format, all price sensitive disclosure required by the RNS regarding company appointments, meetings, deals and transactions, offers, financial statements, dividends, corporate actions, shareholdings, equity, debt, and market related announcements.[8] We screen this news by and end up with a final sample of 53,515 news items. Each of the insider trades is matched with any news releases in the window [-40; -1] to assess whether insiders trades after the news is released and [0;+40] to assess whether insiders trade before the news is announced. While the trading in the first period is legal as the information is publicly available, insider trading in the second period is normally illegal as the UK laws stipulate that insiders should not trade up to 2 months before earnings are announced and up to one month before other news releases.

Finally, we split our sample into cross-listed and domestically-listed companies. We collect by hand data on US cross-listings from Factiva, Amex, Nasdaq and NYSE, Bank of New York and JP Morgan. We obtain the names of foreign companies listed currently and in the past, and the date of the first listing from each stock exchange's web site. We also search Bank of New York and JP Morgan Depositary Receipts databases for OTC listed American Depositary Receipts (ADRs) (Level I) and private placement Rule 144A.[9] We find 115 cross-listed companies that had insider trading during our sample period, of which forty six are

cross-listed on NYSE, twenty one on Nasdaq and one on Amex, and forty eight use OTC-listed ADRs (Level I).[10] Our final sample includes 2,380 (18%) insider trades announcements and 14,666 (27%) news announcements around insider trading in cross-listed firms, and 10,992 (82%) insider trades announcements and 39,654 (73%) news announcements around insider trading in domestically-listed firms.

B.   Descriptive Statistic

Table 1 presents the descriptive statistics, the *t*-statistics for differences in means and the Wilcoxon two-sample test for differences in median between the cross-listed and domestically-listed firms. Panel A. reports the distribution of the fundamental characteristics for the two samples. We define size, *Market Cap,* as the firm's year-end market value of equity and growth opportunities, *M/B*, as the year-end market value over book value of equity. Consistent with Pagano et al. (2002) and Reese and Weisbach (2002), the results indicate that the cross-listed companies are larger and have higher growth opportunities than domestically-listed firms. We also consider profitability measured by the ratio of earnings before interests and tax over total assets (*ROA*) and show that the cross-listed firms have a higher profitability than domestically-listed firms. The *Dividend Yield* (the ratio of dividends over share price) is relatively the same across the two samples. The size, growth and profitability differences between cross-listed and domestically-listed companies indicate a selection bias problem which we address in our regressions.

The results also show strong differences between the buy and sell trades. While the differences in size are not always statistically significant, the results indicate that the buy trades are undertaken mainly in low market-to-book and high yield companies. These results provide an early indication that insiders are likely to adopt contrarian strategies as they buy (sell) in value (growth) firms and support the findings of Jenter (2005) who argues that if managers buy (sell) in low (high) market-to-book company they regard their companies as undervalued (overvalued). This strategy is relatively similar in the cross-listed and domestically-listed companies.

Panel B. reports the characteristics of insider trading variables. *% Holding* is an insider's percentage ownership after the trade and controls for the impact of insiders' total ownership in the company on the return of insider trading. Large changes in manager's portfolio imply change in manager's preferences and are likely to draw attention and influence other investors' trading decisions (Hillier and Marshall, 2002). *Shares Traded*, the ratio of the number of shares traded by an insider to the number of shares outstanding at the

end of the year, is used to test for the magnitude of insider trade. This variable is expected to have better explanatory power than the absolute size of trade, because it is a relative measure.[11] The existing literature suggests that larger trades convey more information and have greater market impact (Easley and O'Hara, 1987). The results show that insiders in cross-listed companies have lower ownership (*% Holding*) and trade lower number of shares in a single transactions (*Shares Traded*) than their counterparts in companies listed domestically. We also check whether insiders split their orders into more trades on the same day. Previous studies show that a high trading frequency indicates informed trading, signaling and misleads other market participants (Kyle, 1985; Easley and O'Hara, 1987; Laffont and Maskin, 1990). The number of insider trades reported on the same day (*Trades per Day*) reveals that insiders in cross-listed firms purchase shares in their company in more transactions than those in domestically-listed firms. Finally, since the market is likely to distinguish between the executors of the trades to assess the quality of the insider information, we define a dummy, *Top Management*, equals to one if the trade is executed by one of these executives, i.e., the Chairmen, the CEO, and the CFO, and zero otherwise. We expect these top executives to have a higher access to price sensitive information. We find that the members of the top management execute more buy trades in cross-listed than domestically-listed firms. For the sell trades, the difference is not statistically significant.

The results also indicate that for the domestically-listed companies the differences between the buy and sell trades are all statistically significant. In particular, there are more buy trades undertaken by the top management and higher buy trades per day than sell trades. However, in buy trades, the size of the trade is smaller and the percentage change in holding is lower than in the case of the sell trades. For the cross-listed companies, the differences are mainly limited to the medians not the means.

We also consider the distribution of the number of trades split into bull (January 1999 to March 2000) and bear (April 2000 to December 2003) periods, and across industries.[12] We find, but we do not report, that the average number of trades in the bull period is larger than that of the bear period in both cross-listed and domestically-listed companies. These results indicate that insiders are much more likely to trade when the stock market is high. We also find that in both sets of companies, insider trading is more prevalent in the financial and cyclical services. We account for industry and sample period differences in the regressions.

[Insert Table 1 here]

C.   Methodology

We use the standard event study methodology based on market model (Brown and Warner, 1985), with the parameters α and β computed over the estimation window [-360, -101] days relative to the event day to investigate the stock price reaction to insider trading. The event period is [-100, +100].[13] We use the FTSE All share index, which covers some 700 UK listed firms, as the market index because our sample includes small as well as large firms. The daily stock prices, adjusted for stock splits and dividends, and the market index are obtained from Perfect Information. We define two event dates to analyze insider trading. The first is the day the insider transaction is released to the RNS and the second is the day the insider transaction was actually executed. According to the regulations the difference between these two dates should not exceed six business days. These two dates allow us to overcome any inconsistencies documented in previous studies (e.g., Friederich et al., 2002, Lasfer, 2004). We also account for this difference by comparing the abnormal returns of insider trades for which the announcement dates and the transaction dates are the same, and for those where the announcement is released at least one day after the transaction date.

We assess the impact of cross-listing on the profitability of insider trading in a multivariate framework by running a set of regressions of the abnormal returns (CAR) cumulated over post-event windows [+2, +40] and [+2, +100] on a range of explanatory variables. The following model is estimated separately for the buy and sell trades

$$CAR_i = \alpha + \underline{B}' \underline{X}_i + \delta CL_i + \varepsilon_i \qquad (1)$$

where *CL* is a dummy variable equal to one if the firm is cross-listed, and zero otherwise and $\underline{X}_{is}$ is a matrix of independent variables used to explain CAR_i, including *Shares Traded, % Holding, Multiple Trading per Day, Top Management,* and *Market Cap.*[14]

We control for selection bias to assess fully the differences in the information content of insider trading between the two sets of firms because market response to insider trading in cross-listed companies can be influenced by changes in the legal and disclosure environment but the decision to cross-list may be driven by firms' fundamental characteristics, such as size and growth, making the cross-listing dummy variable endogenously determined, resulting in biased OLS estimators. In order to control correctly for the size effect and the sample selection bias driven by firms' characteristics, we first include the log of market value of equity in the regression. We then follow previous studies (e.g. Doidge et al. 2004) and account for size effect by using the two stage least squares (2SLS) and two-stage Heckman type procedures (Heckman, 1979).

The second approach to test the information content of insider trading is more direct and intuitive. We analyze all the news announced around insider trading and assess whether this information is price sensitive and whether it is released before or after the insider trades. We measure the price sensitivity of the information by computing the abnormal returns cumulated over [0 to +1] days around the news dates for each news announcement using the same methodology we use to compute the abnormal returns of insider trading.[15] Following a standard approach in the literature (Cheng and Lo, 2006), if the abnormal returns are non-negative (negative), we classify this news as good (bad). To account for up to two calendar months trading ban imposed by the UK regulators, we match each insider trading observation with all news announcements released within 81 trading days around the insider trade observation, [-40, +40].[16] We then relate the abnormal returns of insider trading in the pre-event [-40, -2], event [-1, +1] and post-event [+2, +40] period to the abnormal returns of news announced in these windows to evaluate whether abnormal returns earned on insider trading are driven by the news announcements around insider trading events. Finally, we investigate the impact of cross-listing on the probability that insiders buy before good news and sell before bad news announcements by estimating a set of cross-sectional logistic regressions separately for good and bad news, as follows:

$$Prob(Transaction_i = 1) = \alpha + \beta |CAR|News_i + \varphi |CAR|News_i \times CL_i + \delta CL_i + \kappa MarketCap_i + \varepsilon_i \quad (2)$$

Good (bad) news announcement is an announcement that yields positive (negative) CAR [0,+1]. In the sample of good (bad) news announcements the dependent variable (*Transaction*) equals one if there was a buy (sell) trade by insiders up to 40 trading days before good (bad) news announcement and zero otherwise. The explanatory variables are the dummy for cross-listing, *CL* (defined above) and the absolute value of abnormal returns cumulated over [0,+1] window for each news announcement, $|CAR|News_i$. To account for the differences between cross-listed and domestically-listed firms we introduce a cross-product between CL and $|CAR|News_i$. We control for size as large companies are likely to have more news announcements, and, as in Doidge et al. (2005), we compute and report the marginal effects, of each news type and of the control variables.

II.   Empirical Results

A.   Cross-Listing and the Information Content of Insider Trading – Univariate Analysis

Table 2, Panel A, reports the cumulative abnormal returns (CAR) in the various event windows using the announcement date of the insider trade as day 0. Consistent with previous evidence (e.g., Seyhun, 1986), insiders buy after significant price drop and sell after significant price run-up. This trend is observed for both sets of firms. For example, before the buy (sell) trades, shares prices have decreased (increased) by -0.083 (0.099) for cross-listed companies and by -0.066 (0.127) for the domestically-listed companies. Although the difference in the cumulative abnormal returns between the two sets of companies is statistically significant, the magnitude and the trend in the abnormal returns are similar. These results suggest that insiders in cross-listed and domestically-listed firms are contrarians, and following Brennan and Cao (1996), they imply that these investors are likely to be informed. However, it is not clear as to whether insiders buy (sell) shares in their own company because they feel that their firm is under- (over-) valued, or because they have already announced bad (good) news. We address this issue below when we analyze the type and the quality of the news releases in the pre-trade periods.

We test further the information content of these trades by analyzing the returns over the event and post-event period. For cross-listed companies, the event date abnormal returns ($CAR_{-1, +1}$) are not significant for both buy (0.002, $p = 0.31$) and sell (-0.003, $p = 0.26$) trades. In contrast, for domestically-listed companies, the respective abnormal returns are significant and amount to 0.015 ($p = 0.00$) and -0.004 ($p = 0.00$). The difference in the event abnormal returns is statistically significant for the buy but not for the sell trades. We chose two post-event sub-periods. The first is [+2, +40] to capture the UK legislation, the second is [+2, +100] to compare our results to previous evidence (e.g., Seyhun, 1986). For domestically-listed companies the buy (sell) trades result in positive (negative) and significant abnormal returns in both post-event sub-periods. For example, over the [+2, +100] period, share prices increase by 0.073 after the buy and decrease by -0.053 after the sell trades. These results are consistent with Seyhun (1986) who show that share prices increase by a relatively smaller magnitude of 0.03 ($p = 0.00$) after the buy and decrease by -0.017 ($p = 0.00$) after the sell trade, but they are not fully consistent with Jeng, Metrick and Zeckhauser (2003) and Lakonishok and Lee (2001) who show that, although insider purchases predict abnormal positive returns, insider sales have no predictive power.

In contrast, for cross-listed companies, the post-event abnormal returns are not significant. For the buy trades, although the cumulative abnormal returns are positive, they are not significant in the [+2, +100] period. They are however, positive and significant in the [+2, +40] period. Unlike the domestically-listed firms and in contrast to previous evidence, the

cumulative abnormal returns following the sell trades are, in fact, positive but not significant. The differences in the post-event cumulative abnormal returns between the cross-listed and domestically-listed abnormal returns are all statistically significant, as reported in the last column of Table 2. These results, plotted in Figure 1, indicate that while insider trades in domestically-listed companies are in line with the trends observed in previous studies, the abnormal returns of cross-listed companies are not consistent with previous evidence and may suggest that they are executed for non-information reasons, and therefore may provide ambiguous signals to the market.

[Insert Table 2 and Figure 1 here]

The lack of downward pressure on prices after the sell trades in the post-event period could also indicate that insiders in cross-listed companies are like money managers who undertake strategic trading to minimize the short-run liquidity and information effects (e.g., Chan and Lakonishok, 1993). If insiders trade to minimize the short-run liquidity and information effects, they are expected to split their trades into small amounts. Although this strategy may be costly, it is likely to result in a number of small trades that will cause potential statistical limitation of the investigation because the clustering events, particularly if they are of opposite direction, may mitigate the abnormal returns.[17] We test this possibility by excluding all insider trades that occurred within the first one hundred trading days after the preceding trade in the same company. In line with Del Brio, Miguel and Perote (2002), we expect the abnormal returns to be lower after excluding these confounding events, because single trades are likely to be small and less informative.

Table 2, Panel B., reports the results. Although the number of buy and sell trades observations decreased by about 75% and 55%, respectively, the results are qualitatively similar to those reported in Panel A. These findings may further indicate that insider trading in companies listed abroad is not driven entirely by private information. In contrast, for the domestically-listed companies, the cumulative abnormal returns in each event window are significant, although their magnitude is smaller than the full results reported in Panel A. The last column confirms that the difference in abnormal returns in the event and post-event periods are all statistically significant. Therefore, the exclusion of the confounding transactions does not alter significantly our results, but provides some additional support for our main findings that insider trades executed in domestically-listed companies convey more information than those undertaken in cross-listed companies.

Our results may, however, suffer from size effects as cross-listed companies are significantly larger than domestically-listed firms (Table 1). Given that Lakonishok and Lee

(2001) report that the most significant abnormal returns are associated with smaller firms our results may reflect size differences of the two groups rather than the cross-listing factor. We use two methodologies to account for the size effect. First, we divide our sample into quartiles according to the size measured by market capitalization. Second, we match observations in cross-listed companies with observations in domestically-listed firms by size in each quartile. Table 3 reports the $CAR_{+2,+100}$ for the full sample in each quartile (Panel A.) and the matched control firms (Panel B). In Panel A. the number of observations in cross-listed companies is the highest in the highest quartile (Quartile 4) because cross-listed firms are on average significantly larger than domestic firms. There are 55 and 1,576 observations in quartile 1 and 4 respectively for buy trades and 13 and 381 observations respectively for sell trades. Interestingly, for the buy trades, the abnormal returns of the largest companies (quartile 4) are small and the difference in returns between the two sets of firms is not statistically significant. In contrast, the abnormal returns generated after buy trades in cross-listed companies (CL) are economically and statistically higher than those in domestically-listed firms (DL) in quartile 1 (CL: 0.379 $t = 3.02$; DL: 0.190 $t = 20.79$) and 3 (CL: 0.119 $t = 4.84$; DL: -0.024 $t = -3.18$). In quartile 2 and 4 the differences between cross-listed and domestically-listed firms are insignificant. These results are consistent with Lakonishok and Lee (2001). They indicate that the significant abnormal returns are confined mainly to small firms and suggest that, when size effect is accounted for, the trades undertaken by insiders of domestically-listed companies are not more informative than those of cross-listed firms.

For the sell trades, the abnormal returns are statistically larger for the domestically-listed companies. Panel A and Panel B indicate that, after the sell trades, the abnormal returns of cross-listed companies are either positive and significant or insignificant. In contrast, for the domestically-listed firms, the post-sell trades are negative and significant. The comparison of the market reaction to buy and sell trades implies that the information content of buy and sell trades of insiders in cross-listed firms is asymmetric as these insiders are more likely to use private price-sensitive information to buy stocks when on average all market participants gain, but their sell trades are less likely to be informative.

[Insert Table 3 here]

B.   *Cross-Listing and the Information Content of Insider Trading – Multivariate Analysis*

In this section, we account for fundamental differences between the two groups, by running a set of regressions where the dependent variable is the post-event abnormal returns. Table 4 provides the OLS results. In addition to cross-listing dummy variable (*CL*), we

include variables to control for size, the insider trading characteristics discussed in Table 1 and dummies for year and industry effects. In Panel A. the dependent variable is $CAR_{+2,+40}$. The results indicate that the cross-listing dummy is positive for both the buy and sell trades, suggesting that the post-event abnormal returns of cross-listed firms increase more after the buy trades but decrease less after the sell trades. Overall, these results are consistent with the findings reported in Table 3 as they provide further evidence of the asymmetric market reaction to buy and sell trades. The results also indicate that the post-buy trade abnormal returns are significantly and positively related to the size of the trades (*Shares traded*) and the frequency of insider trading (*Multiple Trading per Day*) and they decrease with size (*Market Cap*). In contrast, the CARs following the sell trades are negatively related to the frequency of the trades and size. Similar results are observed when the dependent variable is defined as the $CAR_{+2,+100}$, as shown in Panel B.

[Insert Table 4 here]

We also use 2SLS and the Heckman procedures to account for other differences between domestic and cross-listed companies. We first estimate the probability of cross-listing by running a logit regression where the dependent variable is equal to one for cross-listed and zero for domestically-listed firms. As in Table 1, we find that cross-listed companies are, on average, larger and have higher growth opportunities than domestically-listed firms. We use a probability of cross-listing in the US as an instrument in the 2SLS regressions. Table 5, columns (2) and (4), report the results. Consistent with the findings in Table 4, the results indicate that for buy trades, the abnormal returns are higher in cross-listed firms. The results also indicate that the CARs are negatively related to size, but increase with the number of shares traded (*Shares Traded*) and the frequency of the trades within one day. These results are in line with previous studies as they indicate that large trades convey more information and have greater impact on stock prices (Easley and O'Hara, 1987) and that insiders split their trades into more orders when they posses private information to insure anonymity or to mislead the regulator (e.g., John and Narayanan, 1997).

For the sell trades, we find positive coefficient for cross-listing dummy which indicates that the profitability of insider sells is lower in cross-listed compared to domestically-listed companies and are in line with our earlier evidence. These results suggest that, in contrast to buy trades, managers in cross-listed companies bond themselves from exercising private benefits of control from insider sells. There is weak evidence that size of the trades and the frequency of the sell trades convey any significant information to the market. The findings show also that firm size (*Market Cap*) is an important determinant of

profitability of insider trading. Given that the post-event abnormal returns are expected to be positive (negative) after the buy (sell) trades, the negative coefficient of firm size suggests that the effect is opposite for buys and sells trades and the profitability of insider buys (sells) decreases (increases) with size of the company.

Columns (3) and (5), report the results of the second step Heckman-type regression results including the Mill's ratio, λ to account for the factors that drive cross-listing. The negative and significant λ indicates that the OLS estimates are biased downward and suggest that the Heckman procedure is more efficient. However, the results are relatively similar to the 2SLS. We also find similar results when the dependent variable is the cumulative abnormal returns over the [+2, +100] period around the insider trading event.[18]

Overall, the results indicate that the market reacts differently to the trades undertaken by cross-listed and domestically-listed companies but suggest that the bonding effects apply mainly in the case of the sell trades as the post-event abnormal returns of the cross-listed firms are higher than those of the domestically-listed firms. In the case of the buy trades, the effect is reverted as the abnormal returns are significantly higher for cross-listed companies. We conjecture that such findings my result from the asymmetric effect of possible expropriation which is likely to be more severe in the case of sales when insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in loosing stocks. On the other hand the expropriation in case of purchases is less harmful when both insiders and outsiders gain from the price increases.

[Insert Table 5 here]

C.   *Cross-Listing and Insider Trading around News Announcements*

We analyze all the news announcements around insider trading to test whether insiders trade on superior information about the value of their company or on private price sensitive information that is released after the trade.[19] The results are reported in Table 6. Column (1) and (6) indicate the total number of observations for all and for each type of news announcement. Column (2) and (7) show the proportion of cross-listed companies in each news group.

Columns (1) to (5) report the results for the buy trades. The average abnormal returns of all the news types announced before the buy trades are undertaken amount to -0.006 (*p*= 0.00) for cross-listed companies and -0.009 (*p*= 0.00) for domestically-listed firms. Interestingly, *Forecasts* (trading statements and management forecast) have the largest significant abnormal returns for both types of companies (CL:-0.052; DL:-0.149). While

trading on information disclosed to the market before insider trading can be considered as 'legal', we find that insiders also trade when and/or before the news are released. These results apply relatively to both sets of companies, suggesting that over the short-event period [-1, +1], insiders disclose price sensitive information and still trade in their company's stock. However, the news following purchases in cross-listed companies is generally immaterial. Only *Forecasts* results in significant positive abnormal returns but this can be due to the fact that forecasts belong to a group of unscheduled news. In contrast, domestically-listed firms continue to disclose price sensitive good news that results in positive abnormal returns, with the exception of *Forecasts* that continue to be negative and significant. Interestingly, insiders in firms listed on the domestic market appear to trade even before the announcement of earnings, despite the UK legislation that states clearly that insiders are not allowed to trade up to two months before such announcements. Column (5) indicates that the news announcements disclosed by domestically-listed firms generate, in general, larger abnormal returns than the cross-listed companies.

The behavior of the abnormal returns of the earnings announcements and forecast is consistent with a number of studies in the accounting literature. For example, Baik and Jiang (2004) report evidence of managers issue pessimistic forecasts so that analysts revise downward their forecast so that they meet or beat the reduced expectations. The results show that, for the domestically-listed firms, the management forecasts are negative in the pre-event period and in the event period but the earnings announcements are positive and significant in the post-event period while the forecast are negative. For the cross-listed companies only the forecasts are positive and significant. The overall results indicate that insiders are likely to buy stock in their own company after announcing bad news. These results are more negative for the domestically-listed companies but they remain statistically significant for both samples and they indicate that insiders do not necessarily buy stocks in their own firms because they feel that they are undervalued. Instead they appear to buy shares to signal their confidence in the future following bad news releases. In general, insiders are likely to time their trades by buying just after a decrease in share prices following an announcement of bad news and then they announce good news that lifts share prices.

Table 6, columns (8) to (10) report the results for the sell trades. In the pre-insider trading period, the news announcements have resulted in an average increase in share price by 0.006 for cross-listed companies and 0.011 for domestically-listed firms. These positive and significant returns are observed for the majority of news types in domestically-listed firms and they are larger than in cross-listed firm. In line with the results for the sell trades reported

in Table 2, these findings suggest that managers sell stock in their companies after announcing good news and their trades do not necessarily signal market undervaluation. The difference in market reaction to news released by cross-listed and domestically-listed firms around and after insiders trading is less pronounced for sells than for purchases. These results suggest that insiders of both cross-listed and domestically-listed companies refrain from trading on insider information, probably to protect themselves from more sever legal consequences associated with sell trades.[20] However, there are some bad and other good news categories, suggesting that insiders do not always sell when they expect bad news, and implying that insiders do not only try to hide their trades by mixing their buy and sell trades as suggested by John and Narayanan, (1997), but they also deliberately disguise their trades by selling before bad as well as good news in order to reap profits at outsiders' expense.[21]

In sum, although our prior results indicate that the profitability of insiders purchases is higher in cross-listed companies, these findings suggest that the reputational risks and the exposure to the two legal systems are likely to restraint insiders of cross-listed firms from buying shares on the basis of insider information and expropriating uninformed investors, while this practice appears to be predominant in the domestically-listed companies.

[Insert Table 6 here]

D.   Cross-Listing and the Probability of Insider Trading on News Announcements

The evidence reported in Table 6 shows a clear difference in the timing of purchases around news announcements across both groups of firms. It reveals that insider buys are motivated by their superior knowledge on price sensitive information that is released after the trade in domestically-listed rather than cross-listed firms. To test the robustness of our findings we check whether insiders in cross-listed companies are indeed less likely to trade on private material information, i.e., to buy before good and sell before bad news announcements, by running a set of logit regressions where the dependent variable is equal to 1 if there is a buy (sell) trade up to 20 and 40 days before good (bad) news releases.

The results are presented in Table 7. Panel A. reports news announced in 20 days (one month) insider trading ban period. Column (1) shows that insiders in cross-listed companies are more likely to buy before favorable news releases. However when we consider impact of news announcements on stock prices *(/CAR/ News×CL)* we find that one percentage point increase in cumulated abnormal returns (CARs) generated by the news announcements decreases the probability of buys by insiders in cross-listed companies by 34% in comparison to the probability of insider buys in domestically-listed firms. The marginal effect for the

impact of news (*|CAR| News×CL*) is -0.34 with t-statistics of -3.01. Interestingly, the deeper analysis of types of news announcements reported in column (2) shows that managers in cross-listed companies are reluctant to buy stock on news on board changes, earnings and management forecasts. Given that insiders expect these types of announcements, the results suggest that insiders are likely to select the news they are willing to trade upon.

Column (3) indicates that the probability of sells before bad news announcements is on average 15% lower for cross-listed than domestically-listed firms for each one percentage point increase in CARs generated by the news. Column (4) indicates that, in line with the buy trades, insiders in cross-listed firms refrain from selling stock mainly before earnings announcements (marginal effect=-0.37, t-stat=-2.12) when compared to the likelihood of trading by insiders of domestically-listed firms.

Panel B. reports the results based on the two month post-insider trading period (*IT up to 40 days prior to news release*) to capture a longer trading ban period that applies to earnings announcements. Overall, the results are consistent with the findings in Panel A. and indicate that insiders in cross-listed companies are mainly constrained from trading before earnings announcements. These findings imply that, given that insiders in cross-listed firms are subject to insider trading rules in the UK and the US, they are more careful in trading on the basis of insider information. This suggests that the bonding contract limits the propensity of these managers to gain private benefits from insider information. Although our initial regression analysis shows some possible expropriation in the case of buy trades these results indicate that the probability that insiders in cross-listed companies execute buy trades using their superior knowledge about their company is lower than that of domestically-listed firms. The analysis of news announcements implies that, unlike the buy trades, insiders are more likely to sell their holdings for liquidity reasons rather than for their superior knowledge about the value of their firm. Therefore, for sell trades, insiders may refrain from cashing out in anticipation of bad news leaving the uninformed investors in long positions in loosing stocks. Such findings may result from a potential exposure and significance of possible more severe penalties in cross-listed firms.

III.   Robustness

In this section we provide some robustness checks of our results. We compare the announcement and the trading dates, assess whether our results are sensitive to the macro-economic cycles, and check if our results are affected by the event study methodology we use.

A.   Announcement Day vs. Trading Day

In Table 2 the event date is the announcement date, i.e., the date when companies report the insider trading in the Regulatory News Service (RNS) although execution of most trades occurs before the information reaches the market. In order to assess whether such potential delay affects our results, we replicate the results in Table 2 using the trading date as the event date. We find that, on average, the information on insider trading is released on the fourth day after the trade is carried out. The median shows that the announcement follows insider transaction on the next day. The results, not reported for space considerations, are qualitatively similar to the findings in Table 2, Panel A, and show statistical differences between cross-listed and domestically-listed firms in mean abnormal returns for both buy and sell trades. Similar results are obtained for the cases where the announcement dates are the same as the trading dates, i.e., where there is no delay in the announcement dates. However, we note that the use of the trading date as the event date results in non-significant abnormal returns on the event date for cross-listed companies and for the sell trades in domestically-listed companies. In contrast, the results based on the announcement date as the event date show significant abnormal returns for both buy and sell trades and for both sets of companies, suggesting that the information on insider trading reaches the market on the day of its announcement not on the execution date. These results do not provide support to Muelbroek, (1992) who reports that, in the US, insider trading is detected by the market when it occurs, i.e., before it is announced. This is partly due to the fact that in the UK insider trading is relatively smaller compared to the total volume of shares traded, as reported in Table 1.

B.   *The Information Content of Insider Trading in Bull and Bear Periods*

In the institutional trading literature, Chiyachantana, Jain, Jiang and Wood (2004) claim that the differential market reaction to buy and sell trades depend on market conditions. They argue that in bullish markets the suppliers of liquidity will not push down prices following a sell order as it is easy to find a buyer, while in bearish markets institutions have to offer discounts to find buyers for their sell orders, resulting in buys (sells) having a bigger and permanent price impact in bullish (bearish) markets. We check for this impact by splitting our sample period into bull (01/1999 to 03/2000) and bear (04/2000 to 12/2003) periods. We use the announcement dates as the event dates to capture this market microstructure effect.[22] The overall results are qualitatively similar to the findings in Table 2, Panel A.

The comparison between the bull and bear periods reveals interesting results. We find that the behavior of share prices following the buy and sell trades does not depend on the market conditions. The findings do not provide support for Chiyachantana, et al. (2004) who

argue that, in bullish markets, the suppliers of liquidity run up prices in the face of a strong buying interest but they do not push down the prices as much when they face a selling interest because they are not so cautious about the sell orders, while in bearish markets the situation is the opposite because many traders are willing to sell at the prevailing prices but fewer traders are willing to buy, suggesting that in bullish (bearish) markets, buys (sells) have a bigger price impact. In contrast, our results show that in both bullish and bearish markets, the post-event abnormal returns in bull market do not increase more than in bearish markets after buy trades. However, for the sell trades, our results suggest that share prices decrease more in the bear market in cross-listed firms.[23]

C.   Other Robustness Checks

We check the statistical robustness of our results by using alternative event study methodologies to compute abnormal stock returns, as the results reported above could be driven by the computation of the market model coefficients, α and β. We use the market adjusted model ($\alpha = 0$ and $\beta = 1$) and the mean adjusted returns model. We find qualitatively similar results. For example, using the mean-adjusted returns model, we find that the abnormal returns for the buy and sell trades in cross-listed companies are not statistically significant in the event period (0.003, $p = 0.13$ for buy and -0.001, $p = -0.87$ for sell), but they are negative and significant prior to the buy trades (-0.096, $p = 0.00$) and positive (0.130, $p = 0.00$) before the sell trades. In the post-event period, they are insignificant. Similarly, the results for the domestically-listed companies mirror the findings reported in Table 2, Panel A. The stock prices decrease before purchases ($CAR_{-100,-2} = -0.120$, $p = 0.00$) and increase around ($CAR_{-1,+1} = 0.013$ $p = 0.00$) and after the trades ($CAR_{+2,+100} = 0.024$ $p = 0.00$). In line with the previous findings, insiders sell after stock price run ups ($CAR_{-100,-2} = 0.178$ p-value=0.00) and before stock price decrease ($CAR_{+2,+100} = -0.015$ p-value=0.04).

Similar qualitative results are obtained when the sample excludes the confounding events and when the event date is the transaction rather than the announcement date. Overall, our results are not dependent on the event study methodology used.

IV.   Conclusions

The paper examines the differences in the market reaction to insider trading in domestically and cross-listed companies. We argue that, since insiders in cross-listed companies are subject to the UK and US insider trading rules, they are less likely to trade on private information and expropriate private benefits at the expense of non-informed investors.

We expect insider trading in cross-listed companies to generate lower event and pot-event period abnormal returns and these trades less likely to be executed before price-sensitive information is released.

We use a large dataset that includes 13,372 insider trading events undertaken in 907 individual companies over the period January 1999 to December 2003 and 53,515 news announcements made by companies in our sample around insider trading events. Consistent with previous evidence, we find that insider trading in the UK conveys information to the market as the abnormal returns are positive for buys and negative for sells during the event and in the post-event windows. We also find that insiders buy (sell) after significant share price decline (run-up), suggesting that insiders adopt contrarian strategies and that they are informed investors. We find, however, significant differences between the two sets of firms. We show that the abnormal stock price behavior around insider trading is confined mainly to domestically-listed firms. The information content of insider trading in cross-listed companies is relatively small. However, when we account for size and other differences between the two sets of firms, we find that the bonding effects apply mainly in the case of the sell trades as the post-event abnormal returns of domestically-listed firms are negative and significant while those of cross-listed firms are relatively random. In the case of the buy trades, the effect is reverted as the abnormal returns are significantly higher for cross-listed companies. These findings result from the asymmetric effect of possible expropriation which more severe in the case of sales as insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in loosing stocks while the expropriation in the case of purchases is less harmful when both insiders and outsiders gain from favorable post-event price changes.

We also analyze the news released before and after insider trading events. In the pre-event period, we find that, for both sets of companies, insiders buy (sell) after releasing bad (good) news, suggesting that insiders are not likely to trade because they can assess better the value of their company. In the post-event period, we find that insider trading in cross-listed companies contains less information than that of domestically-listed companies, suggesting that insiders in cross-listed companies are bonded from trading on price sensitive information. Finally, we find that the probability of buying (selling) before good (bad) news announcements is lower in the case of cross-listed companies. These results provide some support to the hypothesis that insider trading in cross-listed companies contains less information than that of domestically-listed companies, suggesting that the insiders in cross-listed companies are bonded from trading on price sensitive information.

Overall, while we believe that our paper contributes to the discussion of the bonding hypothesis and the private benefits of insider trading that result in an expropriation of uninformed investors, we also think that this remains a fertile area for further research as some of our results are puzzling. In particular, we were unable, at this stage, to explain why so much news is released just after insider trading takes place. Although, the UK legislation is very strict as it stipulates that insiders must not trade up to 2 months before earnings are announced and up to one month before other news releases, we find substantial news announcements during and before insider trading events. Although some of this information is relatively immaterial, it is hard to imagine that an insider can forecast that the information released after the trade will not result in significant abnormal returns. In this context, our results are consistent with previous evidence that show that insider trading rules are not binding (Bhattacharya and Daouk, 2002). The fact that trading on news applies also to cross-listed companies suggests that, as in King and Segal (2004), Siegel (2005) and Licht (2003), the bonding hypothesis is not fully supported. In this paper, we relied on a comparative analysis of insider trading in cross-listed and domestically-listed companies to draw our conclusions that the bonding hypothesis mitigates the propensity of insiders to trade on insider information. Further research will determine whether such results apply also to cross-listing from and in other countries and also whether, relative to companies listed in the US, insiders of cross-listed companies trade differently. In addition, while we consider only insider trading based on the news released by companies themselves, an analysis of trading around news releases by external parties, such as financial analysts forecasts, will isolate the extent to which insiders still trade on insider private information. In this context, Hseih, Ng and Wang (2005) report that insiders are more likely to buy shares in their own company when their company is unfavorable recommended or downgraded by financial analysts. These results are consistent with the overall negative trend in stock prices before insiders buy stock documented in Table 3. However, it will be of interest to analyze all news releases around insider trading events. Finally, our analysis is based on the behavior of the abnormal returns, partly because of data unavailability. The analysis could be expanded further by considering some market structure factors, such as the bid-ask spread, to assess the adverse selection problem. The extent to which these factors will strengthen or contradict our results is a matter of further research.

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Appendix A – **The Insider Trading Environment in the UK and in the US**[24]

The US and UK regulations differ in terms of the definition of insiders, the obligation to report their trades, the timing of the disclosure and the level of law enforcement. Table 1 provides a summary of the various insider trading laws in the US and in the UK as specified mainly in the Securities Act 1933 and the Securities and Exchange Act 1934 in the US, and in the 1985 Companies' Act in the UK. Both these regulations concentrate primarily on unlawful use of non-publicly disclosed price sensitive information as they consider insider trading to occur when a person trades in his or her company's shares using material, current, reliable, not available to the market, and qualified as new, fresh and price-sensitive information according to UK law, or material non-public information according to US law. However, many insider trades are legal, particularly when they are driven by liquidity reasons.

In the case of a possession of material non-public information, the US regulations included in the Securities and Exchange Act 1934, Section 10(b)5 state that insiders must disclose the information before trading or refrain from trading until the news is disseminated (The Disclose or Abstain Rule). In contrast, the UK law imposes trading ban periods on insiders before any price sensitive information is released. For example, insiders are prevented from trading two months before the announcement of the preliminary, interim, or final earnings and within one month before quarterly earnings announcements (Hillier and Marshall, 1998). Outside this ban period, insiders need permission from the chairman of the board before trading. Fidrmuc, Goergen and Renneboog (2006) argue that US regulations favor more frequent news disclosure to avoid misuse of any significant information, whereas UK law prohibits directly insiders from trading before price sensitive news announcement.

Under the 1985 Companies' Act and the London Stock Exchange (LSE) Listing Rules, companies listed on the LSE are required to report any directors' trades in their own firms' securities. In the UK, directors are defined as executive and non-executive members of the board of directors. Corporate insider definition is narrower in the UK than in US where corporate insider includes officers, directors, other key employees, and shareholders of at lest 10% of any equity class. UK disclosure requirements specify that directors must inform their companies without delay about any transaction carried out personally, no later than the fifth business day after the trading date and the company must inform the stock exchange by the end of the following business day and also enter this transaction in the Company Register. The information on insider trading is disseminated immediately to the stock exchange via the online Regulatory News Service (RNS).[25] In the US insiders must report any trades in their

companies' shares within the first ten days of the month following the transaction and sign the SEC form 3, 4, and 5, independently of who does the actual filing. The forms are then disclosed via the Security and Exchange Commission's website. The whole disclosure process takes up to six business days in the UK and up to 40 days in the US. According to the most recent UK and US laws, violation of insider trading regulations results in civil and/or criminal law procedures. Potential penalties and sanctions include up to seven years in jail and unlimited fine in the UK, and in the US up to one million dollar fine, up to ten years in jail, and a civil fine of up to three times the profit gained or loss avoided (Insider Trading and Securities Fraud Enforcement Act 1988).[26]

The analysis of the evolution of insider trading law provides evidence that US law on the books considers larger variety of unlawful cases and is more developed than in the UK (Bainbridge, 2002; 2004). However, the UK regulation is more stringent in terms of the trading prohibition and the timing of the disclosure. The UK laws also are reinforced by the introduction of the new civil offence under the European Market Abuse directive in 2001 that strengthens part V of the Criminal Justice Act 1993. While Fidrmuc et al. (2006) claim that the regulation in the UK is likely to be more severe than in the US, the Insider Trading Law Index (IT Index) reported by Beny (2005) ranks US higher than the UK suggesting that the US has the most restrictive legal regime for insider trading.[27] Although the issue of the quality of insider trading regulations remains unresolved, previous studies provide arguments that the enforcement of the regulations is of primary importance (e.g., Bhattacharya and Daouk, 2002; Bris, 2005). Beny (2005) reports a higher enforcement level in the US than in the UK using the Indices of Public and Private Enforcement Power.[28] Overall, these arguments suggest that the two legal systems are complementary and they are expected to mitigate the propensity of insiders in cross-listed companies to trade on private information.

Table A1. Legal Aspects of Insider Trading in the UK and US

The table provides a comparative analysis of the UK and the US insider trading regulations. [a] Short swing trades are described as buy (sale) trade followed by sale (buy) trade that occur within six months. [b] source Beny (2005). [c] the number denotes cases on Market Abuse and Manipulation, and Insider Trading for the year 2003. There is no information available how many of these cases are related to insider trading. Information on the number insider trading cases was not published prior to year 2003. [d] value in parenthesis denotes the number of defendants and respondents. [e] see La Porta, Lopez-de-Silanes and Shleifer (2006), Beny (2005), and Bhattacharya and Daouk (2002) for more detail analysis on enforcement of insider trading law on a cross-country level. [f] source La Porta et al. (2006)

Aspect	UK	US
Legal Acts on Insider Trading	The Companies Act 1985 under Section 324 and 328; The Code of Market Conduct; The Model Code of the London Stock Exchange 1977; The UK Misuse of Information Act; The Criminal Justice Act; The Listing Rules of the London Stock Exchange (Source Book August 2002, Chapter 16)	The Securities Act 1933; The Securities and Exchange Act 1934 under Section 16(b) ('short-swing' sales[a]) and 10(b)5 (trading on material non-public information); Rule 10b-5 implements the Section 10(b)5; Rule 10b5-1 addresses *The Disclose or Abstain Rule;* Rule 10b5-2 addresses *Misappropriation Theory;* Rule 14e-3 addresses 'constructive insider' issue; The Insider Trading Sanctions Act 1984; Insider Trading and Securities Fraud Enforcement Act 1988
Insider Trading and Director Deal	*Insider Trading* occurs when an insider trades or tries to trade in his or her company's shares based on undisclosed price sensitive information, or improper disclosure to another person, or misuse of information. *Director Deal* (commonly called insider trading) occurs when a director trades on equities in his or her company and reports this fact according to the listing rules of the LSE. They are prohibited by law from trading on price sensitive information. There are trading ban periods in the UK before releasing price sensitive information, with a special focus placed on earnings announcements.	*Insider Trading* occurs when an insider trades in his or her company's shares based on private i.e. 'material' and 'non-public' information. Insiders cannot trade on any private information unless it is made public, in such a way that other investors have access to it.
Insider Definition	A person possessing inside information about the issuer: members of the board of directors, both executive and non-executive directors; members of administrative, management or supervisory body; outsiders having an access to price sensitive information through their employment, profession or duties; other individuals who are in non-business relationship with an insider and thus posses insider information (e.g. spouse, child).	A person possessing inside information about the issuer: 'officers, directors, other key employees and shareholders holding more than 10% of any equity class' '*Officer*: company president, principal financial officer, principal accounting officer, any vice president in charge of any principal business unit, division, or function (such as sales, administration, finance) and any other person that performs policy-making function within the company' (Fidrmuc et al., 2006) *Constructive Insiders*: outsiders working for the company and having an access to 'material' and 'non-public' information as described in the Rule 14e-3

		(e.g. un underwriter, accountant, lawyer, and consultant).
		Family members or other individuals who are in nonbusiness relationship with an insider and thus posses insider information (e.g. spouse, child)
Inside Information	'material, current, reliable, not available to the market, and qualified as new and fresh' (The Misuse of Information Act).	'material' and 'non-public' of two principal forms: *Inside information* – affects company's assets and earnings and comes from internal corporate sources. *Market Information* – affects stock prices or market for the company's securities and comes from outside corporate sources.
Who is obliged to report trades?	Members of the board of directors, both executive and non-executive directors	Officers, directors, other key employees and shareholders holding more than 10% of any equity class
Core of Regulations	*Trading Ban Period* - Insiders are prohibited from trading before release of price sensitive information about earnings announcements to the market. The trading ban pertain insider trading within two months before preliminary, interim, or final earnings announcements and within one month before quarterly earnings announcements. *Permission for trading from the chairman of the board* - When not during the ban period, director needs permission for trading from the chairman of the board.	*The Disclose or Abstain Rule* – Insiders both 'true' and 'constructive', who posses material, non public inside information must disclose the information before trading or refine from trading until the news is disseminated. *Misappropriation Theory* considers a situations when 'person trading on private information violates a fiduciary duty owed to the source of information' but not necessarily to 'investors with whom he trades'. *Rule 14e-3* applies to tender offers and states that insiders of both bidder and target are prohibited from releasing any 'material' 'non-public' information about the tender offer to any third parties who are likely to trade on it.
Disclosure Requirements	Directors must inform their company without delay about any transaction carried out personally, no later than on the fifth business day after the trading date. Subsequently the company must inform the stock exchange by the end of the following business day and also enter this transaction in the Company Register	Insiders must report trades in their companies' shares within first ten days of the month following the transaction. Insiders are required to file SEC form 3, 4, and 5 when they trade in their companies stock. Each insider must sign the form themselves, no matter who does the actual filing.
Disclosure Venue	London Stock Exchange's online Regulatory News Service A Company Register	Security and Exchange Commission's website Wall Street Journal
Evolution of the Regulations	The UK implemented regulations against insider trading in 1980 and enforcing the law in 1981. The UK aims to follow US enforcement power, however the responsibility for regulations and enforcement were spilt between different	Insider trading law is a common law established in 1934. The regulations have evolved over time and benefited form different law cases rather than statutory interpretation of the

	institutions. The insider trading enforcement power was in hands of the Department of Trade and Industry until 2001. At that time insider trading was treated as a criminal or civil offence and law lacked its enforcement. Thereafter, the Financial Services Authority reached the power to impose civil fines for insider trading to increase the effectiveness of the regulations	regulations and have been particularly vital for last 40 years since the first prosecution in 1961. Nevertheless, there is a number of 'doctrinal problems' affecting the enforcement of the regulations.
Quality of Regulations	*Quality of Insider Trading Law Index:* 3 (on the scale 0 to 4).[b]	*Quality of Insider Trading Law Index:* 4 (on the scale 0 to 4).[b]
Legal Procedures against Insider Trading	Criminal law procedure since 1980 and additionally civil law procedure since 2001.	Civil and criminal law procedures
Penalties and Sanctions	Up to seven years in jail and unlimited fine.	Up to $ one million fine and up to 10 years in jail as well as a civil fine up to three times the profit gained or loss avoided. If insider trading involves trading on 'short swings' he or she must return to the company profits earned.
Effectiveness and Enforcement	*FSA Annual Reports* Enforcement insider trading cases initiated by FSA: 2003 – 30[c] *Enforcement Indices*[,e] *Public Enforcement Power Index*[f]*:* 0.63 *Private Enforcement Power Index*[b]*:* 0.00	*SEC Annual Reports* Enforcement insider trading cases initiated by SEC: 1999 – 57 (165)[d] 2000 – 40 (116)[d] 2001 – 57 (115)[d] 2002 – 59 (144)[d] 2003 – 50 (104)[d] *Enforcement Indices*[e] *Public Enforcement Power Index*[f]*:* 1.00 *Private Enforcement Power Index*[b]*:* 10.00

Appendix B - News Classification

Board change: board changes, management appointment, other appointments, company secretary appointment

Earnings: results and dividends

Forecasts: reports, 6k, trading statement, forecasts of results

Capital structure: buyback, capital changes, debt, listing, credit rating, f3

Restructuring: disposal, expansion of business, merger and acquisition, emm (Exempt Market-Makers - disclosure under rule 38.5 on the City Code of Takeovers and Mergers) acquisition of interests, interest in shares, major interest in shares, sale of interests, share transfer, warrants

Ownership: block holding, ownership changes, script dividends, block listing

General business news: agreement, award/cancellation of contract, labor etc., letting, new product, OFGEM (The Office of Gas and Electricity Markets), OFTEL (Regulates telecommunication sector in England and Wales. This regulatory body is now called OFCOM, an independent regulator and competition authority for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services), OFWAT (Regulates water and sewerage providers in England and Wales), OFT (Office of Fair Trading), FDA (Food and Drug Administration), rule8, patents etc., litigation

Miscellaneous news: auditor appointment, financial advisor appointment, other, FRN variable rate fix, circ to shareholders, stabilization notice, form8, share price movement, share price, pricing supplement, stock broker appointment

Other news: Any news observation with news without a name

Table 1. Descriptive Statistics

This table presents the descriptive statistics of companies in our sample. Cross-listed companies are UK companies listed in the US. Domestically-listed companies are UK companies listed only in the UK. Panel A presents firms' fundamental characteristics. *Market Cap* is the year-end market value of equity, *Dividend Yield* is the ratio of dividends over share price, *M/B* is a ratio of market value to book value of equity, and *ROA* is the ratio of earnings before interests and tax over total assets. Panel B provides information on insider trades characteristics. *%Holding* is an insider's ownership in his or her company after the trade. *Shares Traded* is a ratio of a number of shares traded by an insider to the number of shares outstanding at the end of the year. *Trades per Day*: a number of insider trades reported on the same day. *Top Management Trades* denotes trades curried out in one company by Chairman or CFO or CEO over the sample period. [a] Buy Trades are statistically different from Sell Trades at 0.01 level.

	Cross-Listed Companies (CL)		Domestically-Listed Companies (DL)		t_{CL-DL} (p-value)	Wilcoxon Two-Sample Test$_{CL-DL}$ (p-value)
	Mean	Median	Mean	Median	Mean	Median
Panel A. **Fundamentals (firm-years)**						
Buy Trades						
Market Cap (£m)	19,704	4,845 [a]	880 [a]	143 [a]	0.00	0.00
Dividend Yield	5.03 [a]	3.91 [a]	5.18 [a]	4.29 [a]	0.32	0.00
M/B	7.54	2.00 [a]	2.30 [a]	1.41 [a]	0.04	0.00
ROA	0.03 [a]	0.04 [a]	0.02 [a]	0.01 [a]	0.00	0.00
Sell Trades						
Market Cap (£m)	18,612	6,607	643	171	0.00	0.00
Dividend Yield	2.98	2.46	3.25	2.42	0.34	0.45
M/B	20.17	3.07	3.22	2.25	0.07	0.00
ROA	0.07	0.07	0.03	0.02	0.00	0.00
Panel B. **Insider trading (all observations)**						
Buy Trades						
% Holding	0.98	0.00 [a]	1.29 [a]	0.01 [a]	0.08	0.00
Shares Traded (%)	0.01 [a]	0.00 [a]	0.10 [a]	0.01 [a]	0.00	0.00
Trades per Day	2.96 [a]	2.00 [a]	2.18 [a]	1.00 [a]	0.00	0.00
Top Management Trades	17.55	13.00	10.67 [a]	8.00 [a]	0.00	0.00
Number of Observations	1,954		8,460			
Sell Trades						
% Holding	0.83	0.00	2.35	0.03	0.00	0.00
Shares Traded	0.15	0.00	0.40	0.04	0.00	0.00
Trades per Day	1.77	1.00	1.87	1.00	0.22	0.44
Top Management Trades	5.28	3.00	4.69	3.00	0.41	0.95
Number of Observations	426		2,532			

Table 2. Distribution of the Cumulative Abnormal Returns

The table presents cumulative average abnormal returns around insider trading events computed using event study methodology. The market model coefficients α and β are estimated over days -360 to -101 relative to the event, with FTSE All Share Index as the proxy for market portfolio. The full sample includes all insider trading observations. All results are reported relative to insider trading announcement day, i.e., the date of the public announcement of insider trading. In Panel B, we exclude all trades that occur over the [-100, +100] period. Cross-listed companies are UK companies listed in the US. Domestically-listed companies are UK companies listed only in the UK. T-statistics are reported in parenthesis. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

Event periods	Cross-Listed (CL)		Domestically-listed (DL)		t_{CL-DL}
	CAR	t	CAR	t	
Panel A. **Announcement day – all events**					
Buy trades – N	1,954		8,460		
-100, -2	-0.083***	(-8.56)	-0.066***	(-14.95)	2.04***
-1,+1	0.002	(1.03)	0.015***	(19.59)	7.22***
+2, +40	0.020***	(3.34)	0.043***	(15.52)	5.05***
+2, +100	0.019	(1.94)	0.073***	(16.68)	7.06***
Sell trades – N	426		2,532		
-100, -2	0.099***	(5.78)	0.127***	(18.51)	1.73*
-1,+1	-0.003	(-1.12)	-0.004***	(-3.44)	-0.33
+2, +40	0.011	(1.05)	-0.023***	(-5.37)	-3.65***
+2, +100	0.014	(0.80)	-0.053***	(-7.77)	-4.08***
Panel B. **Announcement day – excluding confounding events**					
Buy trades – N	409		2,488		
-100, -2	-0.051***	(-4.08)	-0.037***	(-6.66)	0.76
-1,+1	-0.003	(-1.23)	0.013***	(13.97)	4.13***
+2, +40	0.008	(1.02)	0.039***	(11.18)	3.16***
+2, +100	-0.003	(-0.21)	0.060***	(10.89)	3.87***
Sell trades – N	180		1211		
-100, -2	0.071***	(3.66)	0.114***	(14.08)	1.68
-1,+1	0.003	(0.85)	-0.003**	(-2.34)	-1.64
+2, +40	0.009	(0.74)	-0.014***	(-2.80)	-1.86*
+2, +100	0.018	(0.91)	-0.038***	(-4.73)	-2.33***

Table 3. Distribution of the Post-Event Cumulative Abnormal Returns - Quartile Analysis

The table presents quartile analysis of cumulative average abnormal returns around insider trading events computed using event study methodology. The market model coefficients α and β are estimated over days -360 to -101 relative to the event, with FTSE All Share Index as the proxy for market portfolio. The full sample includes all insider trading observations. All results are reported relative to insider trading announcement day, i.e., the date of the public announcement of insider trading. In Panel A, results for full sample are presented. Full sample is divided into quartiles according to the size (*Market Cap*). In Panel B, observations for cross-listed and domestically-listed companies are matched one by one by size in each of the quartiles presented in Panel A. Cross-listed companies are UK companies listed in the US. Domestically-listed companies are UK companies listed only in the UK. T-statistics are reported in parenthesis. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

Quartile	Cross-Listed (CL)			Domestically-Listed (DL)			t_{CL-DL}
	N	CAR	t	N	CAR	T	
Panel A. **CARs (+2,+100) – full sample**							
Buy trades							
Q1 (smallest)	55	0.379***	(3.02)	2,545	0.190***	(20.79)	-3.32***
Q2	101	0.131*	(1.95)	2,500	0.093***	(11.95)	-0.94
Q3	221	0.119***	(4.84)	2,381	-0.024***	(-3.18)	-5.61***
Q4 (largest)	1,576	-0.013	(-1.23)	1,023	0.001	(0.12)	1.47
Sell trades							
Q1 (smallest)	13	0.842***	(3.50)	723	0.071***	(5.42)	-7.53***
Q2	6	0.278*	(1.82)	731	-0.064***	(-6.10)	-2.27***
Q3	26	0.110	(1.56)	713	-0.123***	(-10.41)	-2.81***
Q4 (largest)	381	-0.030*	(-1.81)	354	-0.158***	(-8.52)	-5.76***
Panel B. **CARs (+2,+100) – matched sample**							
Buy trades							
Q1 (smallest)	55	0.379***	(3.02)	55	0.100**	(2.44)	-3.49***
Q2	101	0.131*	(1.95)	101	0.065**	(2.36)	-1.25
Q3	221	0.119***	(4.84)	221	-0.044**	(2.50)	-4.81***
Q4 (largest)	1,023	0.009	(0.65)	1,023	0.001	(0.12)	-0.68
Sell trades							
Q1 (smallest)	13	0.842***	(3.50)	13	-0.179**	(-2.56)	-5.18***
Q2	6	0.278*	(1.82)	6	-0.569***	(-4.51)	-2.81***
Q3	26	0.110	(1.56)	26	-0.018	(-0.38)	-1.27
Q4 (largest)	354	-0.029	(-1.58)	354	-0.158***	(-8.52)	-5.56***

Table 4. Determinants of the Post-Event Period Abnormal Returns

This table presents the OLS regressions results to explain the cumulative abnormal return after insider trading in the event window [+2, +40] and [+2, +100]. *CL* is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. *% Holding* is an insider's ownership in his or her company after the trade. *Shares Traded* is a ratio of a number of shares traded by an insider to number of shares outstanding at the end of the year. *Multiple Trading per Day* is a dummy variable that equals one if more than one insider trades are reported in same company at the same day. *Top Management* is a dummy variable that equal to one if an insider is Chairman or CEO or CFO and zero otherwise. *Market Cap* equals stock price at the insider trading day times number of shares outstanding at the time of insider trade execution. *Year Dummies* and *Industry Dummies* control for year and industry effects, respectively. T-statistics are reported in parenthesis. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

	Buy				Sell			
	(1)		(2)		(3)		(4)	
Panle A. **CARs (+2;+40)**								
Constant	0.54***	(22.74)	0.54***	(22.42)	0.44***	(9.90)	0.45***	(9.96)
CL	0.05***	(8.26)	0.05***	(8.28)	0.08***	(6.70)	0.08***	(6.65)
Shares Traded	1.26***	(2.58)	1.27***	(2.59)	0.45	(1.58)	0.46	(1.61)
% Holding	-0.04	(-1.25)	-0.05	(-1.38)	0.03	(0.49)	0.03	(0.60)
Multiple Trading per Day	0.02***	(4.14)	0.02***	(4.08)	-0.01*	(-1.87)	-0.01*	(-1.80)
Top Management			0.00	(1.01)			-0.01	(-1.22)
Market Cap	-0.02***	(-19.86)	-0.02***	(-19.78)	-0.02***	(-8.82)	-0.02***	(-8.80)
Year Dummies	Yes		Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes		Yes	
N	10,266		10,266		2,912		2,912	
Adj. R2	0.08		0.08		0.16		0.16	
Panel B. **CARs (+2;+100)**								
Constant	1.05***	(25.06)	1.03***	(24.55)	1.06***	(13.13)	1.07***	(13.15)
CL	0.07***	(6.50)	0.07***	(6.55)	0.21***	(9.03)	0.21***	(9.00)
Shares Traded	0.98	(1.13)	0.99	(1.15)	0.63	(1.22)	0.63	(1.23)
% Holding	-0.20***	(-3.42)	-0.22***	(-3.74)	-0.06	(-0.67)	-0.06	(-0.59)
Multiple Trading per Day	0.01**	(2.06)	0.01**	(1.93)	-0.05***	(-3.67)	-0.05***	(-3.63)
Top Management			0.02**	(2.36)			-0.01	(-0.75)
Market Cap	-0.04***	(-20.93)	-0.04***	(-20.78)	-0.05***	(-11.55)	-0.05***	(-11.54)
Year Dummies	Yes		Yes		Yes		Yes	
Industry Dummies	Yes		Yes		Yes		Yes	
N	10,266		10,266		2,912		2,912	
Adj. R2	0.11		0.11		0.21		0.21	

Table 5. Determinants of the Post-Event Period Abnormal Returns – Selectivity Bias

This table presents impact of selectivity bias on the profitability of insider trading in cross-listed companies using two stage least squares (2SLS) and Heckman two-step estimation. The regressions explain the cumulative abnormal return after insider trading in the event window [+2, +40] and [+2, +100]. In the first step of Heckman procedure the probit regression estimates the probability that a company is cross-listed in the US. λ is a Mill's ratio, a selectivity term computed from the logistic model (the first step Heckman-type model) and used in the second step Heckman-type regression model. In 2SLS an instrumental variable for cross-listing (*CL*) is obtained from the logistic regression and equals a fitted value of probability of cross-listing in the US. In Heckman-type regression model *CL* is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. *% Holding* is an insider's ownership in his or her company after the trade. *Shares Traded* is a ratio of a number of shares traded by an insider to number of shares outstanding at the end of the year. *Multiple Trading per Day* is a dummy variable that equals one if more than one insider trades are reported in same company at the same day. *Top Management* is a dummy variable that equal to one if an insider is Chairman or CEO or CFO and zero otherwise. *Market Cap* equals stock price at the insider trading day times number of shares outstanding at the time of insider trade execution. *M/B* is the market value of shares divided by book value of shares at the end of the year. *Year Dummies* and *Industry Dummies* control for year and industry effects, respectively. T-statistics are reported in parenthesis. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

	Buy			Sell	
	PROBIT	2SLS	HECKMAN	2SLS	HECKMAN
	(1)	(2)	(3)	(4)	(5)
Panel A. CARs (+2;+40)					
Constant	-22.79*** (-52.51)	0.63*** (16.75)	0.55*** (22.78)	0.54*** (7.44)	0.47*** (10.04)
CL		0.11*** (6.18)	0.25*** (5.02)	0.13*** (4.08)	0.23** (2.55)
λ			-0.12*** (-3.97)		-0.10* (-1.64)
Shares Traded		1.04** (2.11)	1.04** (2.12)	0.50* (1.76)	0.45 (1.59)
% Holding		-0.03 (-0.81)	-0.04 (-1.23)	0.02 (0.47)	0.03 (0.55)
Multiple Trading per Day		0.02*** (4.10)	0.02*** (3.96)	-0.01* (-1.74)	-0.01* (-1.76)
Top Management		0.00 (0.99)	0.00 (1.11)	-0.01 (-1.23)	-0.01 (-1.14)
Market Cap	1.03*** (50.43)	-0.03 (-14.13)	-0.03 (-14.49)	-0.03*** (-6.48)	-0.03*** (-6.34)
M/B	0.00* (1.90)				
Year Dummies		Yes	Yes	Yes	Yes
Industry Dummies		Yes	Yes	Yes	Yes
N	13,215	10,266	10,266	2,912	2,912
Pseudo R^2	0.54				
Adj. R^2		0.07	0.08	0.15	0.16
Panle B. CARs (+2;+100)					
Constant		1.34*** (20.19)	1.09*** (25.46)	1.53*** (11.59)	1.16*** (13.87)
CL		0.25*** (7.99)	0.66*** (7.61)	0.44*** (7.54)	0.91*** (5.57)
λ			-0.38*** (-6.81)		-0.46*** (-4.35)
Shares Traded		0.34 (0.39)	0.32 (0.36)	0.71 (1.38)	0.60 (1.18)
% Holding		-0.19*** (-3.20)	-0.21*** (-3.49)	-0.08 (-0.82)	-0.07 (-0.73)
Multiple Trading per Day		0.01* (1.82)	0.01* (1.73)	-0.05*** (-3.49)	-0.05*** (-3.53)
Top Management		0.02** (2.45)	0.02** (2.53)	-0.01 (-0.67)	-0.01 (-0.57)
Market Cap		-0.06 (-16.87)	-0.06 (-17.41)	-0.07 (-10.33)	-0.07 (-10.15)
Year Dummies		Yes	Yes	Yes	Yes
Industry Dummies		Yes	Yes	Yes	Yes
N		10,266	10,266	2,912	2,912
Adj. R^2		0.11	0.11	0.21	0.22

Table 6. News Announcements Analysis

The table reports the market reaction to news announcements around insider trading event windows. We collect data on news announcements from Perfect Information data as reported in the Regulatory News Service and classify this news into 9 categories. We find 53,515 news announcements matched with 7,351 insider trading events over the period 1999-2002. We then compute the abnormal returns for each news item using the market model. We report the abnormal returns over the [0, +1] around news releases. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

	Buy					Sell				
	N		CAR		CL–DL	N		CAR		CL–DL
	All	% CL	CL	DL		All	% CL	CL	DL	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(-40; -2)										
All	21,587	36%	-0.006***	-0.009***	0.003**	5,420	30%	0.006***	0.011***	-0.005***
Board changes	1,814	28%	0.002	-0.006***	0.008***	344	27%	-0.001	0.008**	-0.009
Earnings	5,401	24%	-0.004**	-0.009***	0.005**	1,717	24%	0.009***	0.011***	-0.002
Forecasts	625	40%	-0.052***	-0.149***	0.097***	83	42%	0.023**	-0.014**	0.037*
Capital structure	3,377	45%	-0.006***	-0.006***	0.000	696	33%	0.002	0.014***	-0.012***
Restructuring	2,911	44%	-0.001	0.004**	-0.005**	845	32%	0.008**	0.018***	-0.010***
Ownership	1,760	24%	-0.008**	-0.001	-0.007***	438	21%	-0.002	0.000	-0.002
General business	1,087	44%	0.000	-0.002	0.002	292	33%	0.009**	0.027***	-0.018**
Miscellaneous	2,318	38%	-0.005**	-0.005***	0.000	593	36%	0.001	0.001	0.000
Other	2,294	46%	-0.009***	-0.005**	-0.004	412	48%	0.008*	0.017***	-0.009
(-1; +1)										
All	3,054	26%	-0.003	-0.006***	0.003	545	25%	0.007*	0.000	-0.007
Board changes	198	19%	0.005	0.012**	-0.007	41	29%	-0.012	-0.003	-0.009
Earnings	792	16%	-0.023***	0.004	-0.027***	172	22%	0.009	0.004	0.005
Forecasts	140	26%	-0.068***	-0.204***	0.136***	14	36%	-0.007	-0.032**	0.025
Capital structure	532	38%	0.007*	-0.003	0.010	84	37%	0.006	0.007	-0.001
Restructuring	400	32%	0.005	0.024***	-0.019**	58	14%	0.005	0.002	0.003
Ownership	166	22%	0.020**	0.015***	0.005	50	10%	0.024	-0.012*	0.036***
General business	138	53%	0.017**	0.023**	-0.006*	25	16%	0.028	0.047***	-0.019
Miscellaneous	333	19%	0.008	-0.017***	0.025***	56	36%	0.007	-0.009	0.016
Other	355	27%	-0.021**	0.006	-0.027	45	27%	0.014	-0.029***	0.043*
(+2; +40)										
All	18,218	40%	0.000	0.005***	-0.005***	4,691	34%	0.000	0.001	-0.001
Board changes	1,468	29%	0.000	0.005**	-0.005**	360	23%	0.001	0.001	0.000
Earnings	2,493	37%	0.003	0.004**	-0.001	832	38%	0.007**	-0.001	0.008**
Forecasts	586	31%	0.014***	-0.032***	0.046***	131	39%	-0.018**	0.012*	-0.030**
Capital structure	3,727	47%	-0.002	0.003**	-0.005***	866	40%	0.003	-0.005**	0.008***
Restructuring	2,432	47%	0.000	0.010***	-0.010***	697	35%	0.002	0.008***	-0.006
Ownership	1,922	27%	0.003	0.004**	-0.001	515	22%	0.007	0.002	0.005
General business	1,223	49%	0.001	0.021***	-0.020***	287	25%	-0.003	0.010**	-0.013*
Miscellaneous	2,373	37%	-0.003	0.001	-0.004*	629	33%	-0.011**	-0.006**	-0.005
Other	1,994	44%	0.003	0.015***	-0.012***	374	43%	-0.005	0.001	-0.007

Table 7. News Announcement Regression Analysis – Logit

This table presents logistic regression analysis to explain the probability that insiders buy (sell) stock up to 20 trading days before good (bad) news announcements. Marginal effects are presented in the table. The marginal effects for continuous explanatory variables are calculated at their means and for the dummy variables they are evaluated as the discrete change in the expected value of the dependent variable, from zero to one. Good announcement is an announcement that yields non-negative CAR [0,+1]. In the subsample of good news announcements the dependent variable equals one if there was a buy trade by insiders up to 20 trading days before good news announcement and zero when otherwise. Bad announcement is an announcement that yields negative CAR [0,+1]. In the subsample of bad news announcements the dependent variable equals one if there was a sell trade by insiders up to 20 trading days before good news announcement and zero when otherwise. *Market Cap* equals stock price at the insider trading day times number of shares outstanding at the time of insider trade execution. *Cross-Listing* (*CL*) is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. *CL × |CAR| News* is a cross-product between cross-listing dummy and the event period abnormal returns of the news that is released up to 20 trading days after insider trade. *CL × |CAR| Board Changes (CL × |CAR| Earnings, CL × |CAR| Forecasts, CL × |CAR| Capital Structure, CL × |CAR| Restructuring, CL × |CAR| Ownership, CL × |CAR| General Business, CL × |CAR| Miscellaneous, CL × |CAR| Other)* is a cross-product between cross-listing dummy and the event period abnormal returns of the news in a group *of Board Changes (Earnings, Forecasts, Capital Structure, Restructuring, Ownership, General Business, Miscellaneous, Other)* that is released up to 40 trading days after insider trade. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively. Panel B. present analogous analysis to explain the probability that insiders buy (sell) stock up to 40 trading days before good (bad) news announcements.

	Good News		Bad News	
	(1)	(2)	(3)	(4)
Panel A. **IT up to 20 days prior to news release**				
Constant	-0.23*** (-13.30)	-0.23*** (-14.07)	-0.19*** (-16.80)	-0.17*** (-16.86)
Market Cap	0.00*** (3.67)	0.00*** (4.75)	0.01*** (9.27)	0.01*** (9.44)
CL	0.02*** (4.19)	0.02*** (3.60)	-0.01** (-2.27)	-0.01** (-2.23)
|CAR| News × CL	-0.34*** (-3.01)		-0.15** (-2.11)	
|CAR| News	-0.05 (-1.01)		0.01 (0.48)	
|CAR| Board Changes × CL		-0.72* (-1.86)		-0.57 (-1.30)
|CAR| Board Changes		0.06 (0.59)		-0.09 (-0.76)
|CAR| Earnings × CL		-1.14*** (-3.64)		-0.37** (-2.24)
|CAR| Earnings		-1.03*** (-6.71)		-0.30*** (-3.62)
|CAR| Forecasts × CL		0.51 (0.83)		0.39 (1.05)
|CAR| Forecasts		-0.79** (-2.11)		-0.36 (-1.35)
|CAR| Capital Structure × CL		-0.02 (-0.11)		-0.05 (-0.47)
|CAR| Capital Structure		0.16** (2.43)		0.09* (1.71)
|CAR| Restructuring × CL		0.04 (0.22)		0.01 (0.06)
|CAR| Restructuring		0.03 (0.36)		0.08 (1.55)
|CAR| Ownership × CL		0.03 (0.11)		0.08 (0.53)
|CAR| Ownership		0.09 (0.81)		0.10* (1.87)
|CAR| General Business × CL		0.11 (0.46)		-0.50 (-1.64)
|CAR| General Business		0.05 (0.46)		0.15*** (3.14)
|CAR| Miscellaneous × CL		-0.27 (-1.04)		-0.09 (-0.59)
|CAR| Miscellaneous		-0.07 (-0.61)		0.03 (0.43)
|CAR| Other × CL		0.02 (0.09)		0.09 (0.83)
|CAR| Other		0.08 (0.86)		-0.03 (-0.43)
N	26,351	26,351	27,935	27,935
Pseudo R^2	0.00	0.01	0.00	0.01

Table 7. Continued

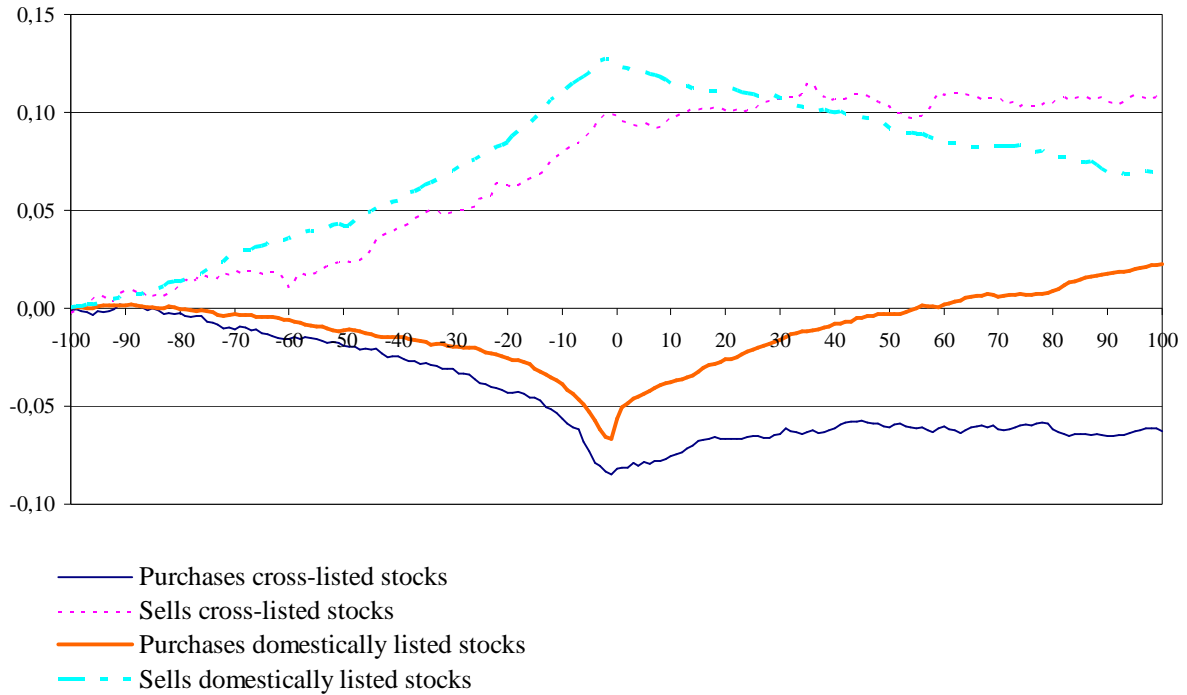|	Good News				Bad News			
	(1)		(2)		(3)		(4)	
Panel B. **IT up to 40 days prior to news release**								
Constant	-0.39***	(-15.60)	-0.41***	(-16.75)	-0.35***	(-21.86)	-0.33***	(-21.96)
Market Cap	0.01***	(6.38)	0.01***	(7.95)	0.01***	(13.51)	0.01***	(13.82)
CL	0.05***	(5.81)	0.03***	(4.39)	-0.02***	(-3.62)	-0.02***	(-4.17)
|CAR| News × CL	-0.27*	(-1.88)			-0.20**	(-2.04)		
|CAR| News	-0.15**	(-2.14)			-0.03	(-0.73)		
|CAR| Board Changes × CL			-0.21	(-0.54)			-0.99**	(-1.96)
|CAR| Board Changes			0.23	(1.24)			0.08	(0.68)
|CAR| Earnings × CL			-0.96**	(-2.60)			-0.07	(-0.34)
|CAR| Earnings			-2.16***	(-9.73)			-0.82***	(-6.17)
|CAR| Forecasts × CL			-0.15	(-0.20)			0.64*	(1.94)
|CAR| Forecasts			-0.02	(-0.03)			-0.10	(-0.49)
|CAR| Capital Structure × CL			0.59**	(2.26)			-0.06	(-0.32)
|CAR| Capital Structure			0.14	(1.39)			0.09	(0.95)
|CAR| Restructuring × CL			0.88***	(2.88)			0.07	(0.43)
|CAR| Restructuring			-0.12	(-0.58)			0.13*	(1.66)
|CAR| Ownership × CL			0.48	(1.34)			0.18	(0.77)
|CAR| Ownership			0.10	(0.59)			0.21***	(2.58)
|CAR| General Business × CL			0.08	(0.22)			-0.80**	(-1.97)
|CAR| General Business			0.25	(1.48)			0.24***	(2.92)
|CAR| Miscellaneous × CL			0.05	(0.14)			0.16	(0.81)
|CAR| Miscellaneous			0.06	(0.50)			-0.02	(-0.15)
|CAR| Other × CL			0.18	(0.62)			0.15	(0.62)
|CAR| Other			0.11	(0.55)			-0.28*	(-1.95)
N	26,351		26,351		27,935		27,935	
Pseudo R^2	0.01		0.02		0.00		0.01	

Figure 1. Cumulative Abnormal Returns around Insider Trading Announcement

The Figure presents cumulative average abnormal returns around insider trading events [-100, +100] computed using event study methodology. The market model coefficients α and β are estimated over -360 to -101 days relative to the announcement date of insider trading, with FTSE All Share Index as the proxy for market portfolio. Cross-listed companies are UK companies listed in the US. Domestically-listed companies are UK companies not listed in the US.

[1] See Seyhun (1998) for a survey. For example, a number of studies report insider trading around corporate events, such as announcement of new stock offering (Karpoff and Lee, 1991), stock repurchases (Lee, Mikkelson and Partch, 1992), filing for bankruptcy protection (Seyhun and Bradley, 1997), earnings forecasts (Penman, 1982), takeovers (Seyhun, 1990; Bris, 2005), dividend announcements (John and Lang, 1991), and exchange listings and de-listings (Lamba and Khan, 1999). Other studies document the abnormal returns of insider trading and of the portfolios strategies that mimic insiders (e.g., Jaffe, 1974; Finnerty, 1976a, 1976b; Seyhun, 1986, 1988a, 1988b; Rozeff and Zaman, 1988; and Lin and Howe, 1990). Similar results are reported in the UK (e.g., Pope, Morris and Peel, 1990; Friederich, Gregory, Matatko and Tonks, 2002; Hillier and Marshal, 2002). Lakonishok and Lee (2001) report that the long-term post-event abnormal returns are positive for buy and negative for sell trades. However, there is debate as to whether these abnormal returns are high enough to allow outsiders to obtain exceptional returns because of transactions costs (e.g., Friederich et al., 2002; Bettis, Vickrey and Vickrey, 1997), or the strategic trading behavior of insiders who deliberately disguise their trades to reap gains at outsiders' expense (John and Narayanan, 1997).

[2] For example, although in the UK the 1985 Companies' Act prohibits insiders from trading for a period of up to two months prior to the announcement of earnings and up to one months prior to other price-sensitive information, there are difficulties in defining what price-sensitive information consists of (in addition to earnings, dividends, restructuring, board changes and security issues), and what is the theoretical movement in share price that makes a piece of information price-sensitive (e.g., Friederich et al., 2002).

[3] UK has the largest number of cross-listed companies (171), after Canada (266) and Japan (206), primarily in the US (Sarkissian and Schill, 2004).

[4] These characteristics include the effectiveness of outside shareholder protection rights, dispersion of ownership, and common law origins that prevent insiders from trading on private information.

[5] Since UK and US are relatively similar in their governance system, we do not proclaim to test directly the bonding hypothesis as developed by Cofee (1999, 2002) and Stulz (1999), which states that managers bond themselves from extracting private benefits of control and expropriating minority shareholder by cross-listing their companies in the US where legal regulations are stricter, law enforcement more efficient and minority shareholder rights are

protected better than in any other country as they have to conform to US accounting (US GAAP) and securities law, particularly if they list their companies stocks on stock exchanges rather than the over-the-counter (OTC) market and Portal (Rule 144a). (See, e.g., Reese and Weisbach, 2002; Doidge, 2004; Doidge et al., 2004; Doidge et al., 2005; and Siegel, 2005, for arguments and tests of this hypothesis). To test directly this bonding hypothesis we need to select cross-listed companies from a country, other than the UK, with inferior corporate governance level than the US. Unfortunately, we didn't find consistent data. Therefore, we cautiously use "legal bonding hypothesis" to refer primarily to the exposure of our cross-listed companies to the UK and to the US insider trading legislations.

[6] Similar sample section is adopted in previous studies (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).

[7] The sample size is comparable to recent insider trading studies in the UK. For example, Gregory et al. (1997) use 6,756 transactions for 1,683 companies between January 1986 and December 1990, Friederich et al. (2002) use 4,399 transaction for 196 companies between October 1986 and December 1994, Hillier and Marshall (2002) use 7,796 transaction for 1,350 companies between September 1991 and March 1997 and Fidrmuc et al., (2006) use 10,140 buys and 5,523 sells in 1991-1998.

[8] See Appendix B for details on the classification of the news announcements.

[9] Bank of New York and JP Morgan provide information on the most recent programs. Stock exchanges, other than NYSE, do not provide information on past foreign listings. To complete our cross-listing sample, we check each company's web site and historical data.

[10] Some of the cross-listed companies use two ways to list their ADRs. In such a case we consider this type of listing that imposes stricter regulatory and disclosure requirements. We do not have ADRs that involve only Rule 144a Private Placement.

[11] In previous versions of the paper we also controlled for changes in insider holding from pre to post trade (*Change in Portfolio*). However, both *Change in Portfolio* and *%Holding* proxy for insiders' ownership and have similar economic meaning. To capture size effect of the trade *Value of* Trade (logarithm of actual value of trade expressed in British Pounds) was used in addition to *Shares Traded*. The variables used in this version of the paper yield better statistical significance.

[12] Given that the second period covers 45 months while the bull period spans over only 15 months, we analyse the number of trades per month. We group the 40 industries into 10

Financial Times Stock Exchange Actuaries Industry Sectors. These sectors are (The number of all listed companies, as reported in the *Financial Times* dated 21 April 2005*,* in each sector is in parenthesis): *Resources:* Mining and Oil and Gas (30); *Basic Industries:* Chemicals, Construction and Building Materials, Forestry and Paper, and Steel and Other Metals (46); *General Industrials:* Aerospace and Defense, Electronic and Electrical Equipment, Engineering and Machinery (47); *Cyclical Consumer Goods:* Automobile and Parts, and Household Goods and Textile (16); *Non-Cyclical Consumer Goods:* Beverages, Food producers and processors, Health, Personal care and household products, Pharmaceuticals and biotechnology, and Tobacco (57); *Cyclical Services:* General retailers, Leisure and hotel, Media and entertainment, Support services, and Transport (196); *Non-Cyclical Services:* Food and drug retailers, and Telecommunication services (20); *Utilities:* Electricity and water (15); *Information Technology:* Information technology hardware, Software and computer services (43); *Financial:* Banks, insurance companies, Life assurance, Investment companies, Real estate, Speciality and other finance (219).

[13] We started by using a shorter event [-40, +40] and estimation [-220, -41] periods. However, we find that the alphas of the market model are significant over the estimation period. We therefore, use periods to capture fully the abnormal performance.

[14] All the variables are defined in section II.B. *Multiple Trading per Day* enters the regressions as a dummy variable that equals one if more than one insider trades are reported in the same company on the same day. *Top Management* is also a dummy variable equal to one if a trade was undertaken by Chairman or CEO or CFO.

[15] Other studies ranked news according to market expectations. For example, Palmon and Schneller (1980) use 'Wall Street Journal' news and show them to fifteen financial analysts. They classify news as good or bad "if at least ten analysts judged them as such without any a priori expectations".

[16] After the matching procedure, we have 7,351 insider trades linked to 53,515 news releases.

[17] This problem appears when cross-sectional correlation is present in the sample and the standard errors are not properly estimated. We believe that this difficulty is circumvented because our analysis is based on daily data, we use diversified sample across industry sectors, and we account for the cross-sectional dependence in the *t*-statistics used to test for statistical significance of abnormal performance. Nevertheless, we exclude any confounding events to check for robustness of our results.

[18] The whole analysis was repeated with additional control variable for growth opportunity (M/B). The main regression results were essentially the same. The additional results are available form author upon request.

[19] Consistent with Lasfer (2004), we find that for both cross-listed and domestically-listed firms, only about 4% of insider trades are undertaken when no news was announced over two months before and two months after (i.e., -40 to +40 days) the insider trading event. For the remaining 96% of insider trading events we compute for each individual news announcement the average abnormal returns over the [0 to +1] period when the news is released.

[20] An anecdotal evidence of insider trading just before news announcements can be illustrated by the following quotation from the *Financial Times* dated Tuesday, September 27 2005, p. 48 "De La Rue, the banknote printing company, gained 2.8 per cent to 381p as brokers Merrill Lynch and Numis Securities urged clients to follow the lead of the company's chief executive and finance director and buy shares in the wake of Friday's trading statement". We checked this case and find that the information is actually released after the insider trades.

[21] We tried various event windows, including [±40, ±31] and [±30, ±2] to capture the requirement that companies should not trade one month before the news is announced, and also [±40, ±6] and [±5, ±2] to assess how quickly insiders trades before and/or after the news is announced. We find relatively similar results.

[22] The results based on the trading dates as the event dates are also very similar.

[23] We find similar results when the sample is limited to non-confounding trading events. These results are, in fact, much closer to the findings in Panel A. For cross-listed companies the abnormal returns on the announcement dates of buy and sell trades are not significant and none of the differences in abnormal returns between the bull and bear periods is significant. For the domestically-listed companies, the differences between the bull and bear periods in announcement date abnormal returns for buy and sell trades are not significant. These results are not reported for space considerations but they are available upon request.

[24] Our analysis is based on findings in previous literature (e.g., Hue and Noe, 1997; Bettis, Coles and Lemmon, 2000; Lakonishok and Lee, 2001; Friederich et al., 2002; Bainbridge, 2002, 2004; Beny, 2005; Bris, 2005; Fidrmuc et al., 2006), an interview with the Financial Services Authority in the UK (FSA), and information from websites of the SEC (www.sec.gov) and the FSA (www.fsa.gov.uk).

[25] See Bozcuk and Lasfer (2005) for details on reporting trades in the London Stock Exchange.

[26] The Sarbanes-Oxley Act of 2002 amended the regulations governing the reporting of insider transactions by shortening the reporting period, requiring insiders to report transactions within 2 business days, and requiring that all reports be filed electronically.

[27] The IT Index takes into account the tipping of outsiders by insiders about private, price sensitive information, insider trading on private, price sensitive information, and level of potential material and criminal penalties and sanctions.

[28] Beny (2005) develops the Indices of Public and Private Enforcement Power and includes features of the securities market supervisors and their investigative power, efficiency of courts, and private rights to undertake a security law case by private plaintiffs against individuals who violate insider trading regulations. Until 2001, the insider trading enforcement power was in the hands of the Department of Trade and Industry in the UK. Currently, it is delegated to the Financial Services Authority (FSA) which can impose civil fines for insider trading to increase the effectiveness of the regulations which is lacking as there are only four cases of successful law enforcements between 2001 and 2004 with five individuals fined and the penalties range between £15,000 ($25,500) and £45,000 ($75,500) (Financial Times, April 2, 2004 and December 17, 2004).