

Insider Trading and International Cross-Listing

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Abstract:

We compare the information content of insider trading in UK companies cross-listed in the US (cross-listed) to that in UK companies without a US-listing (domestically listed). We argue that, because of the bonding hypothesis and a much stricter enforcement regime, insiders of cross-listed companies are less likely to trade on private information. While, for the sample as a whole, insiders appear to be informed as they buy (sell) after significant price decline (run-up), we report that the information content of insider trading is more prevalent in domestically-listed firms. We find statistically lower abnormal returns in the event and post-event periods for insider buy trades in cross-listed companies and, for the sell trades, these abnormal returns are negative and significant only for domestically-listed companies. Although both sets of companies are subject to insider trading activity after and before news announcements, the news preceding insider trading in cross-listed companies is, in general, immaterial while that of domestically-listed companies is price-sensitive. These results hold even after controlling for endogeneity and other differences across the two samples. Overall, the results suggest that the bonding hypothesis mitigates the propensity of insiders in cross-listed firms to trade on insider information.

Key words: Bonding hypothesis, Insider trading, International cross-listing, Information asymmetry

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Comments are welcome

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Insider Trading and International Cross-Listing

1. Introduction

Insider trading is often regarded as an illegal transaction because it is considered to be based on non-publicly available insider information, resulting in an expropriation of outside uninformed shareholders. Although insiders may trade for non-information related reasons, such as liquidity or miss-valuation, their trades are likely to be subject to tight scrutiny by the regulator, particularly if, after the trade, share prices change substantially. In the literature, there is an intensive debate and many controversies as to whether insider trading should be fully prohibited to mitigate any potential expropriation. (See Bainbridge, 2002, and Bhattacharya and Daouk, 2002 for a review). A number of studies provide evidence that insider trading should be illegal precisely because insiders trade on private information, earn significant exceptional returns resulting in a wealth transfer from uninformed to informed investors (e.g., Friederich, Gregory, Matatko and Tonks, 2002, Lakonishok and Lee, 2001, and Seyhun, 1986). Maug (1999) argues that if insider trading is not prohibited, then both insiders and controlling shareholders will benefit but at the expense of the minority shareholders. Insider trading could also result in market inefficiency if it leads to illiquidity through a loss of investor confidence and if investment strategies that mimic insider trades can be devised to beat the market. These arguments provide support for the current insider trading regulations in the vast majority of countries (Bhattacharya and Douk, 2002).

Results from other studies (see Hu and Noe (1997) for a survey) support deregulation and imply that insider trading is beneficial as it increases market efficiency because any private information becomes compounded quickly into share prices. This private information can be related to the news released after the trade or, alternatively, to the insiders' assessment of the true value of their miss-valued firms. This activity is also difficult to regulate because of the complications in defining the trader and the 'price-sensitive' information, separating insider trading on private information from trading for portfolio changes and liquidity, and the controversies as to whether insider trading is profitable after transaction costs are accounted for. Although, in many countries laws prohibit insider trading based on private information, they are inefficient as only few cases emerged from these rules (Bhattacharya and Douk, 2002).

The purpose of this paper is to extend this research and assess the extent to which insider trading is constrained by the regulation by testing the hypothesis that insiders of UK cross-listed companies in the US are less likely to trade on private information because they face stricter enforcement regimes as they are subject to the two countries' legal requirements. We focus on UK cross-listed firms for a number of reasons. First, the UK has the largest number of companies listed in the US market.¹ Second, the legal environment in the UK is relatively mild compared to that in the US because while the UK laws are stricter, they appear to be less effective as fewer cases than the US were actually brought to court despite prior evidence of UK insiders trading on privileged information (e.g., Friederich et al., 2002, and Lasfer 2004). Third, although the UK and the US markets have relatively similar corporate governance characteristics,² the exposure into the two legal systems is expected to decrease the trading profits of insiders and result in the insider trading activity to be undertaken for liquidity rather than information purposes, especially, since at the margin, the corporate governance system in the US generally scores better in different rankings than the UK system (La Porta et al., 1998, 2005). This relative superiority of the US system presents an attractive research environment to test whether managers of UK cross-listed companies are subject to the 'bonding contract' (Coffee, 1999, 2002; Stulz, 1999) as they become subject to increased disclosure requirements, a stronger and more effective legal system, and more thorough investor monitoring than UK companies without a US-listing (referred thereafter as domestically-listed companies). We, thus, expect this bonding contract to prevent cross-listed companies from taking excessive private benefits through insider trading based on private information. In addition, previous studies report that cross-listing in the US decreases the level of information asymmetry and improves firm's visibility through greater analyst coverage, better accuracy and increased media attention (e.g., Baker, Nofsinger and Weaver, 2002; Lang, Lins and Miller, 2003, 2004). These arguments suggest that the information content of insider trading is likely to be lower in the UK cross-listed compared to domestically-listed companies, implying that the announcement date and post-announcement date abnormal returns of insider trading in cross-listed companies should be insignificant and these trades should be less likely to occur before price-sensitive information is released.

We use a sample that includes all insider trading transactions in the UK over the period 1999 to 2003, resulting in 958 individual companies and 13,529 observations. We split companies in the sample into cross-listed (18%) and domestically-listed (82%). We use the market model to estimate the event period abnormal returns. Given that traders have up to 5 days to report their trade, we consider two event dates, the actual transaction date, referred to as the trading date, and the announcement date, i.e., the date the transaction is actually reported by the company to the London Stock Exchange under the Regulatory News Service (RNS). We also analyze any news announcements 40 trading days before and 40 trading days after the date of each insider trading observation to assess whether insiders trade before or after material news is announced.³ We find 55,818 news announcements, 37% of which are made by cross-listed firms. We split these announcements into ten different categories (e.g., board change, earnings, forecasts, and restructuring) and we use the market model to compute the abnormal returns over the event period [-1 to +1] relative to the date the news is announced to assess whether the news is price sensitive. We then relate the abnormal returns in the pre- and post-insider trading dates to the abnormal returns of the news to evaluate whether the insider trading abnormal returns can be explained by the news and whether insiders trade before material news is announced.

The overall results show that insiders are contrarians as they buy after a significant price decline (-0.048 , $p = 0.00$) and sell after a significant price run up ($+0.056$, $p = 0.00$). The buy trades result in positive and significant abnormal returns in the event and post event periods (0.013 , $p = 0.00$, and 0.046 , $p = 0.00$, respectively), and the sell trades by negative returns (-0.005 , $p = 0.00$, and -0.030 , $p = 0.00$, respectively). The pattern of these abnormal returns provide support to Brennan and Cao (1996) who suggest that investors that adopt contrarian strategies by selling after a price rise and buying after price decline are likely to be informed. These results are consistent with previous findings (e.g., Fidrmuc, Goergen and Renneboog, 2005, and Lasfer, 2004) and imply that insiders convey information to the market and that non-informed investors could follow these trades and fortify the exceptional returns gained by directors. However, we report significant differences across domestically and cross-listed firms. Although the pre-event abnormal returns are relatively the same for both samples, we find that the event date abnormal returns are not significant for cross-listed companies.

In the post-event period [+2, +40], the cumulative abnormal returns are positive and significant for both samples, but they are statistically higher for the domestically-listed companies (0.030 versus 0.049, t of difference = 4.14). For the sell trades, the post-event cumulative abnormal returns are not statistically significant for the cross-listed companies (0.002, $p = 0.88$). However, they are negative and significant for domestically-listed companies (-0.036, $p = 0.00$). The difference between the two sets of companies is statistically significant ($t = -3.74$). We find qualitatively similar results when we exclude the confounding events and when we define the event date as the transaction instead of the announcement date, but the event date abnormal returns are higher on the announcement, relative to the trading dates, suggesting that the market reacts more when the news is announced than when the actual trade takes place. 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.

We investigate further these results to assess whether the pre- and post-insider trading abnormal returns are driven by news announcements. We analyze all news categories announced by our sample companies during 81 days of insider trading dates. We show that, for the sample as a whole, the average abnormal returns of the news announced before the buy trades are -0.009 ($p = 0.00$) and +0.011 ($p = 0.00$) before the sell trades. These results appear to suggest that insiders do not trade because they feel that their company is miss-valued, but they buy after bad news and sell after good news. These abnormal returns are significantly larger for domestically-listed companies but they remain statistically significant for both samples. While these trades based on information already disclosed to the market can be considered to be 'legal', we find that insiders also trade before the news is disclosed. We find positive news announcements in the post insider trading period but this news appears to be immaterial for cross-listed firms. For the sell trades the news released is, on average, not price sensitive, suggesting that insiders in both sets of firms refrain from trading on private information.

In line with previous studies (e.g., Pagano, Roell and Zechner, 2002), we find that cross-listed firms are large, and have a higher market-to-book than domestically-listed firms. We, therefore, consider that the decision to cross-list is endogenously determined and that the two samples may not be directly comparable. Given that the cross-listed companies are relatively large, the high abnormal returns observed in

domestically-listed companies may be driven by size as Lakonishok and Lee (2001) report that the most significant abnormal returns are associated with smaller firms. In addition, since cross-listed companies are likely to have low information asymmetry (Baker et al, 2002; Lang et al., 2003, 2004), our results may not be related solely to the bonding hypothesis. We tried to mitigate these problems by selecting a control sample based on size. Although the sample was reduced significantly, we find qualitatively similar results. To preserve the sample size and to account for endogeneity and other control variables in the regressions, we adopt the Heckman-type procedure. We find that, compared to domestically-listed companies, cross-listed firms generate significantly lower returns and that the impact of their news releases prior and following insider buy trades is less pronounced. The news released in the post-sell trades is not significant but it is material on the insider trading event dates for domestically-listed firms. We conclude that the bonding contract mitigates the propensity of insiders to trade on insider information and that the difference between the buy and sell trades before the news is announced is likely to result from the asymmetric effect of possible expropriation which may be less harmful in buy trades as both insiders and outsiders gain from any price increases, but more severe in sell trades as insiders cash out in an anticipation of bad news leaving the uninformed investors holding losing stocks.

To our knowledge, no previous study has linked insider trading to the bonding hypothesis. Thus, our study complements previous studies that tested the bonding hypothesis (e.g., Pagano et al. 2002; Reese and Weisbach, 2002; Doidge, Karolyi and Stulz, 2004; Seigel, 2005) and expands previous evidence on insider trading (e.g., Friederich, et al., 2002; Fidrmuc et al., 2005). For example, Fidrmuc et al. (2005) study insider trading in the UK over the period 1995-1998. They focus on news released prior to insider trading. We provide an out of sample evidence and show that insiders trade after and also before news announcements, but the trading on insider information is more prevalent in domestically-listed firms. However, our results call for further research as some insiders in both sets of firms trade before material news is announced.

The remainder of the paper is organized as follows. Section 2 presents the review of the literature and the insider trading environment in the UK and the US. Section 3 describes the data and the methodology. Section 4 discusses the results and the conclusions are in Section 5.

2. The insider trading environment in the UK and in the US

In this section we review the literature on insider trading, provide a global description of the insider trading laws, discuss the phenomenon of cross-listing and distinguish between the information content of insider trading in cross-listed compared to domestically-listed companies.

2.1. Review of the literature on insider trading

A number of empirical studies provide evidence that corporate insiders use private information to strategically trade their own shares around corporate events and gain significant abnormal returns. For example, research has shown that insiders trade around the announcement of new stock offering (Karpoff and Lee, 1991), stock repurchases (Lee, 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, on the other hand, find that insider trading is not necessarily followed subsequently by news releases, but insiders trade to signal under- or over-valuation because they are able to better assess the value of their firm and take a long-term view of its prospects (e.g., Gregory et al., 1994). Givoly and Palmon (1985) introduced the idea of the leading indicator that allows outside investors to track insiders' trades, because insiders are capable of assessing better their companies' values. This signaling motive, also developed in other transactions such as share repurchases, implies that insiders are able to manipulate their own companies' share prices. However, this signaling argument is likely to apply only to the buy trades, but not necessarily to the sell transactions.

The empirical evidence provided to-date is mixed. Early investigations conducted in the US (e.g., Jaffe, 1974; Finnerty, 1976a) showed that insiders are able to earn significant exceptional returns, around 5% and 7% respectively during the first five months after trading. Subsequently, Seyhun (1986), in a more comprehensive research that controls for firm size, finds significant abnormal returns when insiders trade. The long-term post-event abnormal returns are also found to be positive for buy and negative for sell trades (e.g., Lakonishok and Lee, 2001). Similar results are obtained in other markets such as the UK (e.g., Pope, Morris and Peel, 1990, for sales and Gregory

et al., 1994, for purchases). However, there is debate as to whether these abnormal returns following insider trading are high enough to allow outsiders to obtain any exceptional returns because of transactions costs (e.g., Friederich et al., 2002; Bettis et al., 1997), or the strategic trading behavior of insiders who deliberately disguise their trades to reap gains at outsiders' expense (John and Narayanan, 1997).

At policy level, insider trading raises a number of important issues. First, insider gains imply that financial markets do not compound private information and that there is a wealth transfer from uninformed investors to individuals with privileged information (e.g., Seyhun, 1986; Gregory et al., 1997; Friederich et al., 2002). This raises the question as to whether insider trading practices affect the liquidity and efficiency of financial markets (Bainbridge, 2000). For some, insider trading increases efficiency as prices after the trades will reflect both publicly and privately held information. Thus, the rules against insider trading prevent prices from reflecting the correct value of the firm and, thus, damages market efficiency (e.g., Manne, 1966; Meulbroek, 1992). For others, insider trading leads to inefficiency and illiquidity because when non-informed investors are aware of the wealth transfer induced by insider trading they will refrain from trading (Kyle, 1985). These arguments suggest that regulators and financial community should track these transactions to fully assess insider gains and any distortions in prices that result from these trades and they should advocate and impose a set of rules to enhance investors' confidence about the fairness of trading in financial markets.

Although currently, almost all countries consider insider trading based on private information to be illegal, the rules lack enforcements (Bhattacharya and Daouk, 2002). This is partly due to the essence of the regulation and its level of enforcement, the problems of defining this activity and the insider, and the trading disclosure rules. 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). The next section discusses how cross-listing might mitigate the trading on insider information.

2.2. *Cross-listing and insider trading*

Previous studies have identified a number of reasons for cross-listing. The segmentation hypothesis stipulates that foreign listing results in a reduction in the cost of capital because it helps overcome the segmentation of the local equity market (Foerster and Karolyi, 1999). Foreign listing also increases firm's visibility (Baker, Kent and Nosfinger, 2002), and facilitates capital-raising (e.g., Alexander, Eun and Janakiramanan, 1988; Blass and Yafeh, 2000). Pagano et al. (2002) report that cross-listing in the US occurs because of its skilled analysts, higher liquidity, and higher product and capital market. Despite these advantages, there are some costs in cross-listings, namely the increased public scrutiny and pressure on the managers, increased reporting and disclosure requirements, additional listing fees, and increasing liability exposure (e.g., Huijgen and Lubberink, 2005). These costs have not deterred many firms to cross list in the US. Coffee (2002) observes that cross-listing is happening more into countries with higher disclosure standards and enforcement power. Coffee (1999, 2002) and Stulz (1999) developed the 'bonding hypothesis' under which corporate governance and shareholders' interests could be better protected by the bonding effect induced when firms implement the cross-listing program in markets with higher disclosure requirements and stricter regulations. Doidge et al., (2004) show that cross-listed firms are valued more highly from the perspective of shareholders' structure because the decision of cross-listing reduces the opportunity to extract private benefits for controlling shareholders due to the higher disclosure requirements which usually occur in cross-listing programs.⁴

These arguments suggest that the bonding hypothesis will constraint insiders of cross-listed companies from trading on private information, particularly if foreign legislation is tighter than the domestic insider trading rules. At the same time, insider trading activity in cross-listed companies is likely to have less information content and and/or to occur before news announcements that will result in significant stock price changes, because cross-listing in the US decreases the level of information asymmetry and improves the firm's visibility through greater analyst coverage, better accuracy and increased media attention (Baker et al, 2002; Lang et al, 2003, 2004). We account for these factors in the empirical section. The next section assesses whether the insider trading legal rules in the US are superior to support further the bonding arguments.

2.3. *Insider trading and the enforcement system in the UK and the US*⁵

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. The US regulations included in the Securities and Exchange Act 1934, Section 10(b)5 state that insiders, who possess 'material non-public' information must disclose the information before trading or refrain from trading until the news is disseminated (The Disclose or Abstain Rule). In the UK the law imposes trading ban periods on insiders before any price sensitive information is released. For example, insiders are prevented from trading two months before preliminary, interim, or final earnings announcements 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 et al. (2005) 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.

The definition of insider trading is similar in the two countries. Insider trading occurs 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, not each insider trade is illegal. When an insider trades in his or her firm for liquidity reasons, without using any private and price sensitive information, and reports the trade, then such a trade is not considered illegal. A crucial difference between US and UK regulations arises in terms of the definition of insiders obliged to report their trades, timing of the disclosure and the level of law enforcement.

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 least 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. 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. The information on insider trading is disseminated immediately to the stock exchange via the online Regulatory News Service (RNS).⁶ In the US insiders must report any trades in their companies' shares within the first ten days of the month following the transaction. They are required to file SEC form 3, 4, and 5 when they trade in their companies stock. Each insider must sign the form 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).⁷

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 the UK law (Bainbridge, 2002; 2004). However, in the UK, the regulation is more stringent in terms of trading prohibition and timing of the disclosure. While Fidrmuc et al. (2005) claim that the regulations in the UK are likely to be more severe than in the US, the Insider Trading Law Index (IT Index) reported by Beny (2004) ranks US higher than the UK suggesting that the US has the most restrictive legal regime for insider trading.⁸ 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 (Bhattacharya and Daouk, 2002; Beny, 2004; Bris, 2005). Beny (2004) reports a higher enforcement level in the US than in the UK using the Indices of Public and Private Enforcement Power.^{9, 10} These arguments suggest that cross-listing is likely to mitigate the propensity of insiders to trade on insider information because they are subject to a higher level of insider trading regulations than insiders of domestically-listed companies.

[Insert Table 1 here]

3. Data and methodology

3.1. Data

We use a large database of directors' dealings spanning from January 1999 to December 2003. The database of directors' dealings is provided by 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.¹¹ In addition, we exclude all directors' transactions in investment companies. This screening has resulted in 13,529 insider trades in 928 listed companies, split into 10,540 (82%) purchases and 2,989 (18%) sells.¹² Our sample period is limited to five years because of data availability. Nevertheless, it covers two main interesting sub-periods: the worldwide boom (January 1999 to March 2001) and bust (April 2001 to December 2003) in stock markets.

We split our sample into cross-listed and domestically-listed companies. We collect by hand data on US cross-listings from Amex, Nasdaq and NYSE stock exchanges, Bank of New York and JP Morgan. From each stock exchange's web site, we obtain the list of foreign companies listed currently and in the past, and for the date of the first listing. For missing dates of first listings, we searched Factiva database. We also search Bank of New York and JP Morgan Depository Receipts databases for OTC listed American Depository Receipts (ADRs) (Level I) and private placement Rule 144A.¹³ 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).¹⁴ In our sample we do not have ADRs that involve only Rule 144a Private Placement. Consequently, the majority of those companies are subject to stricter corporate governance system than their home country. Our final sample includes 2,399 (18%) cross-listed and 11,130 (82%) domestically-listed of which 82% and 77% are buy trades, respectively.

We then collect data on news announcements from Perfect Information database as reported in the Regulatory News Service (RNS) for each company in our sample. This data includes company names, announcement dates, news types and its brief description. The database includes 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.¹⁵ We match each insider trading observation with all other news announcements within 81 trading days around the insider trade observation [-40, +40]. We investigate the 81-day period to account for the up to two calendar months ban imposed by the UK regulators. We matched 7,815 insider trades announcements with 55,818 news announcements over the period 1999-2002.¹⁶

3.2. *Methodology*

To investigate the stock price reaction to insider trading we apply the standard event study methodology based on market model (Brown and Warner, 1985), with the parameters α and β computed over the estimation window [-220, -41] days relative to the event day. We use the FTSE All share index as the market return because it covers about 800 UK listed companies and our sample includes small as well as large firms. The adjusted daily stock prices for splits and dividends and the market index are obtained from Perfect Information. The event period is [-40, +40].

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. The difference between these two dates could be up to 5 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 insider trading abnormal returns for companies for which the announcement dates and the transaction dates are the same, and for the remaining we report the results based on the two separate dates. The results are also reported separately for cross-listed and domestically-listed firms and for buy and sell trades.

We then test for the impact of news announcements on insider trading. We first identify all news announcements around the [-40 to +40] trading days around the insider trading dates. We then compute the abnormal returns for each news announcement using the same methodology applied to the insider trading, described above. We consider the abnormal returns cumulated over [-1 to +1] days around the news dates to assess whether the information is price sensitive.¹⁷ We then relate the pre-event window abnormal returns of insider trading to the abnormal returns of news announced in that

window. This procedure enables us to assess whether the pre-event period abnormal returns are driven by the management assessment of the value of their firm, or by the type of news announced. We do the same for the event and post-event period abnormal returns to assess whether insiders trade on price-sensitive information. We also use a cross product between each event window news and a dummy for cross-listing (*News confounding with IT*CL*) to test whether the news announcements have different impact on CARs from insider trading in companies cross-listed and those listed domestically.

Finally, we assess the information content of insider trading by running a set of regressions of the cumulative abnormal returns (CAR) of each event window, [-40, -2], [-1, +1] and [+2, +40] on various explanatory variables, as follows:

$$CAR_i = \alpha + \underline{B}' \underline{X}_i + \delta CrossListing_i + \phi News * CL + \phi News + \varepsilon_i \quad (1)$$

$$CAR_i = \alpha + \underline{B}' \underline{X}_i + \delta OTCListing_i + \zeta ExchangeListing_i + \phi News + \phi News * CL + \varepsilon_i \quad (2)$$

where *News* is defined as confounding with the insider trading window. \underline{X}_{is} are independent variables used to explain CAR_i . In the base model (1) we use a dummy variable equals to one if the firm is cross-listed (*CrossListing*) to capture the cross-listing effect. We include the following exogenous independent variables in our model:

Value of Trade: This variable measures the wealth of insider, is computed as the logarithm of actual value of trade expressed in British Pounds. The existing literature suggests that larger trades convey more information and have greater market impact (Easley and O'Hara, 1987). We also simulate the results using *Shares Traded*, i.e., the number of shares traded by an insider scaled by the number of shares outstanding at the end of financial year to assess the magnitude of insider trade relative to his or her company. *Shares Traded* is expected to have better explanatory power than the absolute size of trade, because it is a relative measure.

Holding in Company: This variable controls for the impact of insiders' total ownership in the company after the trade. We also use changes in insider holding from pre to post trade (*Change in Portfolio*). Large changes in manager's portfolio are likely to draw attention and impact behavior of market participants, because of the change in manager's preferences (Hillier and Marshall, 2002).

Multiple Trading per Day, Multiple Trading in 30 Days: The frequency of insider trading serves as a good proxy for informed trading and signaling because the

insiders can split up their trades to mislead uninformed traders (Kyle, 1985; Easley and O'Hara, 1987; Laffont and Maskin, 1990). We measure insider trading frequency within one day and within 30 calendar days. *Multiple Trading per Day* is a dummy variable that equals one if more than one insider trades are reported in the same company on the same day. *Multiple Trading in 30 Days* is a dummy variable that equals one if more than one insider trades are reported in the same company within 30 calendar days.

Job title of the trader: We collect information on the identity and job title of the trader from the primary database Directors' Dealings. We split the directors in 4 main categories: Chairmen, CEO, CFO, and other executives. We find that in about half the cases, the job title of the trader is not disclosed. We treat these cases as *Non Disclosed*. We expect the market to be able to assess the quality of the insider information by distinguishing between the traders.

Finally, we collect data on the firm's fundamentals such as size, profitability, and market-to-book to control for the financial characteristics of the company. Size is defined as the log of the firm's year-end market value of equity. We define profitability as the return on assets (ROA) and market-to-book as the year-end market value of equity over shareholders' funds. We control for year and industry effects.¹⁸

It may be inappropriate to conclude about the differences in the information content of insider trading between the two sets of firms without controlling for selection bias. Market response to insider trading in cross-listed companies can be influenced by changes in the legal and disclosure environment. Nevertheless, the decision to cross-list may be influenced by firms' fundamental characteristics and hence our cross-listing dummy variables may not be exogenous. Previous studies find that cross-listed firms are larger and grow faster than a typical peer company listed domestically (Reese and Weisbach, 2002; Doidge et al., 2004). Thus, the OLS estimators of cross-listing may be biased. To control for potential sample selection, bias we use two-stage Heckman-type procedure (Heckman, 1979) applied in previous studies (e.g., Doidge et al., 2004). This method is described in Appendix B.

4. Empirical Results

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics of the sample. For the buy trades, the average value of all the trades is £0.06m. While the difference in means between cross-listed companies and domestic companies is not statistically significant, the median indicates that the trade value of domestically-listed firms is higher than that of cross-listed firms. There is significant difference between cross-listed and domestically listed companies in insider holdings after the trade, proportion of shares traded and trades per day. The change in holding is relatively similar between the two groups. For the sell trades, the only statistical difference is in the proportion of holdings where insiders of domestically listed companies hold much larger proportion of shares in their company than the insiders of cross-listed companies. Unlike the buy trades, the number of sell trades per day is statistically similar between the two groups. In buy and sell trades, the number of trades per day is higher than one indicating that either more than one insider trade on the same day or the same insider split her orders in order to mask her trades. However, the buy trades per day are significantly larger than the sell trades, indicating that insider buy more often than they sell. The median sell trade values and the proportion of market value traded (*Shares traded*) are larger than the buy trades, but the insiders' post-trade holdings and the changes in their holdings after their sell trades remain higher than their buy trades, suggesting that insiders sell less often their stakes.

The companies' fundamentals reported in Table 2, Panel B also confirm significant differences between cross-listed and domestically-listed companies. Consistent with Pagano et al. (2002), the results indicate that the cross-listed companies are larger and have higher growth opportunities than domestically-listed firms. We also show that cross-listed companies have a higher profitability than domestically-listed firms. The t statistics for differences in means, and the Mann-Whitney test for differences in median show statistical differences between the two groups of firms. The dividend yield is relatively the same across the two samples. These apparent differences between cross-listed and domestically listed companies indicate a selection bias problem which we address in our regressions.

Table 2 reports also the distribution of the number of trades split into bull (January 1999 to March 2000) and bear (April 2000 to December 2003) periods, and

into the job title of the trader (Panel C.) and industry (Panel D.). Given that the second period covers 45 months while the bull period spans over only 15 months, we report the number of trades per month. The table shows that the average number of trades in the bull period is larger than that of the bear period, for both buy and sell and for cross-listed and domestically-listed companies. The average number of buy trades per month decreased from 39.7 to 30 for cross-listed companies and from 173 to 133 for the domestically-listed companies. Similarly, the monthly sell trades decreased from 10 to 6 and from 61 to 36 over the two periods for the two sets of firms. These results indicate that insiders are much more likely to trade when the stock market is high. The distribution of the trades by the job title of the trader indicates that the largest identified traders hold a position of the chairman and the chief executive officer (CEO). The chief finance officer (CFO) is the third largest trader in the domestically-listed companies.¹⁹

Finally, Table 2, Panel D., reports the distribution of the trades by industry. We group the 40 industries into 10 Financial Times Stock Exchange Actuaries Industry Sectors.²⁰ The results show that for the cross-listed companies, trading is more prevalent in the financial sector, and in cyclical services, and non-cyclical consumer goods. For the domestically listed companies, trading is also more prevalent in the financial sector, cyclical services, general industrials and basic industries. We also note a decrease in the average number of trades per month for the buy and sell trades and for the cross-listed and domestically-listed firms and this decrease is observed in most industrial sectors. There are, however, some sectors where trading has increased. For example, in the IT sector, the average number of buy trades in domestically-listed companies has increased from 5.8 to 12.7. We account for industry differences in the regressions.

[Insert Table 2 here]

4.2. *Abnormal Returns*

Table 3, Panel A, reports a summary of the behavior of share prices around insider trading announcement for the sample as a whole and for the two groups of firms. For the sample as a whole, the results indicate that share prices increase by 0.013 ($p = 0.00$) on the announcement date of buy trades and decrease by -0.005 ($p = 0.00$) on the sell trades. Insiders appear to adopt contrarian strategies as they buy after significant price decline of 0.048 ($p = 0.00$) and sell after significant price run up of 0.056 ($p =$

0.00). In the post-event period share prices increase by 0.046 ($p = 0.00$) after the buy trades and decrease by -0.030 ($p = 0.00$) after the sell trades. The pattern of these abnormal returns is consistent with Brennan and Cao (1996) who suggest that investors that adopt contrarian strategies by selling after a price rise and buying after price decline are likely to be informed. These results provide support to previous UK evidence (e.g., Fidrmuc et al., 2005, and Lasfer, 2004), and imply that insiders convey information to the market, but they are not fully consistent with the US evidence that shows that insider purchases predict abnormal positive returns but insider sales have no predictive power (e.g., Jeng, Metrick and Zeckhauser, 2003; Lakonishok and Lee, 2001).

The next three columns report significant differences between cross-listed and domestically-listed firms. The results indicate that, for cross-listed companies, the event date abnormal returns are not significant for both buy (0.002, $p = 0.78$) and sell (-0.003, $p = 0.58$) trades. In contrast, for domestically-listed companies, the respective abnormal returns amount to 0.015 ($p = 0.00$) and -0.005 ($p = 0.00$). The difference in the event abnormal returns is statistically significant for the buy but not for the sell trades. Although the pre-event abnormal returns are relatively the same for both cross-listed and domestically-listed companies, we note significant differences in the post-event period [+2, +40]. For the buy trades, the cumulative abnormal returns are positive and significant for both samples, but they are statistically higher for the domestically-listed companies (0.03 versus 0.049, t of difference = 4.14). For the sell trades, the post-event cumulative abnormal returns are not statistically significant for the cross-listed companies (0.002, $p = 0.88$), but they are negative and significant for domestically-listed companies (-0.036, $p = 0.00$) and the difference between the mean returns of two sets of companies is statistically significant ($t = -3.74$). These results, plotted in Figure 1, indicate that insider trades in domestically-listed companies are in line with trends observed in other studies (Friederich et al., 2002; Hillier and Marshall, 2002) but the abnormal returns of cross-listed companies appear to follow a different trend.

The results for cross-listed companies are consistent with previous studies on institutional trading that report that the market reacts differently to the buy and sell trades (e.g., Bozcuk and Lasfer, 2005; Keim and Madhavan, 1996). These studies show that purchases have a larger permanent price impact than sales as prices increase (decrease) after a buy (sell) transaction, they remain high after the buys but they revert

after the sells. Amongst the reasons advocated for this called *permanent price impact asymmetry* is that purchases are more likely to be based on private information because they create new long term positions (Keim and Madhavan, 1996) and that buy trades are more likely to convey positive firm specific news because they imply a choice of one security amongst all the stocks in the market (Chan and Lakonishok, 1993). In contrast, the sell trades are likely to be executed for different reasons, and therefore may provide ambiguous signals to the market (e.g., Hillier and Marshall, 2002). In addition, the lack of downward pressure on prices in the post-event period might indicate that insiders in cross-listed companies are like money managers as they may be involved in strategic trading in a way that will minimize the short-run liquidity and information effects (e.g., Chan and Lakonishok, 1993). This possibility is investigated further by analyzing the impact of confounding events.

[Insert Table 3 and Figure 1 here]

4.3. *Confounding Events*

If insiders trade to minimize the short-run liquidity and information effects, they are expected to split their trades into small amounts, although this may be costly. This strategy will result in a number of small trades that will cause potential statistical limitation of the investigation because the clustering events may drive the abnormal returns.²¹ We test this possibility by excluding all insider trades that occurred within the first five trading dates after the preceding trade in the same company. In line with Del Brio, Miguel and Perote (2002), we expect the abnormal returns after excluding the confounding events to be lower, because single trades are likely to be small.

Table 3, Panel B., reports the results. Although the number of buy and sell trades observations decreased by about 45% and 32%, respectively, the results are qualitatively similar to those reported in Panel A for the full sample. The abnormal returns for the sample of cross-listed companies are smaller in value yet still insignificant on the event dates [-1, +1]. These findings may further indicate that insider trading in companies listed abroad are not driven entirely by private information. The abnormal returns for the sample of domestically listed companies are also smaller in value and their statistical significance remains unchanged at the 0.01 level. The *t*-test in the last column confirms the statistical difference between abnormal returns of buy

transactions over the event dates [-1, +1] at the 0.01 level, and of buy and sell transactions over the post-event period [+2, +40] at the 0.01 and 0.05 level, respectively. Therefore, the exclusion of the confounding transactions does not alter our results, but provides additional support to our main findings that insider trades executed in domestically listed companies convey more information than those executed by directors of cross-listed companies.

4.4. *Announcement Day vs. Trading Day*

In Table 3, the event date is the announcement date, i.e., the date when companies report the insider trading in the Regulatory News Service (RNS). The London Stock Exchange rules require companies to report any such trades without delay. However, the traders may have up to 5 days to report to the company their trades. In order to assess whether such potential delay affects our results, we replicate the results in Table 3 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. Table 4, Panel A., reports the results for the full sample. The results are qualitatively similar to the findings in Table 3, Panel A. For cross-listed companies, share prices go down by -0.002 ($p = 0.98$) when insiders buy and go up by 0.005 ($p = 0.08$) when insiders sell. The positive abnormal returns on the sell trading day may suggest that it was easier to find a buyer. For domestically-listed firms, share prices go up by 0.009 ($p = 0.00$) on the buy trading date and they do not change on the sell trade. The differences in mean abnormal returns are statistically significant for both buy and sell trades.

Panel B. presents the results of the cases where the announcement dates are the same as the trading dates, i.e., where there is no delay in the announcement dates. The results mimic the findings reported in Table 3, Panel A., and indicate that insider trading in cross-listed companies is less informative than that in domestically-listed companies. Panel C. and Panel D. report the results of the cases where the trades are reported up to 5 days after they are executed. In Panel C. we use the trading dates as the event dates. The results are consistent with the overall findings. 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 (Panel D) indicate significant abnormal returns for both buy and sell trades and for both sets of companies. These results indicate that the information on insider trading reaches the market on the day of its announcement not the day of the trade execution. 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 2.

[Insert Table 4 here]

4.5. *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 (January 1999 to March 2000) and bear (April 2000 to December 2003) periods. We use the trading dates as the event dates to capture this market microstructure effect.²² The overall results reported in Table 5 are qualitatively similar to the findings in Table 3, Panel A. We note that the differences in the pre-event abnormal returns between the cross-listed and the domestically-listed companies for both buy and sell trades are all significant. In the bear period, the difference between the cross-listed and domestically-listed firms in the event date abnormal returns for the sell trades is significant ($t = -3.20$) but the difference in the post-event period abnormal returns following the sell trades is not significant ($t = -1.28$).

The comparison between the bull and bear periods reveals interesting results. For cross-listed companies, the event date abnormal returns [-1, +1] are not significant for both the buy and sell trades. Table 5, Panel C. reports that the differences between the two periods are not statistically significant ($t = -1.14$ and -0.42 for buy and sell trades, respectively). In the pre-event period, the cumulative abnormal returns are relatively similar across the two periods, but in the post-event period, share prices

increase more after the buy (0.017, $p = 0.38$ vs. 0.033, $p = 0.00$, $t = 1.72$, $p = 0.08$) and decrease more after the sell (0.024, $p = 0.28$ vs. -0.018, $p = 0.58$, $t = -1.94$, $p = 0.04$). Although, the results indicate that the behavior of share prices following the buy and sell trades depends on the market conditions, they do not provide full 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 event day abnormal returns are not significant and that share prices do not increase more than in bearish markets after buy trades. However, for the sell trades, our results are consistent with this argument as share prices decrease more in the bear market.

The difference between the bull and bear periods is much more pronounced for the domestically-listed firms. In particular, the abnormal returns on the sell trades increase by 0.007 ($p = 0.03$) in the bull period but decrease by -0.004 ($p = 0.04$) in the bear period (t of difference in means between the two periods is -4.38). In the pre-event period, share prices decrease more before the buy trades in the bear period (-0.017 vs. -0.057, $t = -7.20$) but they increase less before the sell trades (0.097 vs. 0.036, $t = -6.41$). In the post-event period, share prices increase more in the bear period after the buy trades (0.034 vs. 0.059, $t = 4.81$) and decrease less after the sell trades (-0.050 vs. -0.029, $t = 2.17$). These results suggest that the market conditions affect the abnormal returns but they are not fully consistent with Chiyachantana, et al (2004) arguments.²³

[Insert Table 5 here]

4.6 *Impact of news announcements*

We test whether our results are driven by news announced by our sample firms around insider trading dates. 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 [-1 to +1] period when the news is released. The results are reported in Table 6. The first column indicates the total number of observations for all and for each type of news announcement. The second column shows the proportion of cross-listed companies in each news group. Panel A., reports the results for the buy trades. In the pre-event period, there were 21,885 pieces of news announcements, 35% of which are made by cross-listed companies. The majority of this news relates to earnings (25%), capital structure (16%) and restructuring (14%). The proportion of news announced by cross-listed firms ranges between 24% for results and ownership to 45% for other category.

The average abnormal returns of all the news types announced before the buy trades are undertaken amount to -0.009 ($p = 0.00$). These results indicate that insiders are likely to buy stock in their own company after announcing bad news. Interestingly, all the news categories (except restructuring, general business, and board change) generate negative and significant abnormal returns. *Forecasts* (trading statements and management forecast) have the largest significant abnormal returns, followed by *earnings* and *capital structure* with -0.13, -0.008 and -0.009, respectively. 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 announcements.

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. On the insider trading event [-1, +1], the average abnormal returns of news announcements is -0.013 ($p = 0.00$) with forecasts amounting to -0.177 ($p = 0.00$). These results apply relatively to both sets of companies, suggesting that over this short-event period, insiders disclose bad information and still buy their company’s stock. In the post-event period, companies announce mainly good news that results in positive abnormal returns, with the exception of *forecasts* that continue to be negative and significant. Interestingly, insiders appear to trade even before the announcement of earnings which result in average abnormal returns of 0.005 ($p = 0.00$), despite the UK legislation that states clearly that insiders are not allowed to trade up to 2 months (about 40 trading days) before such announcements. We note, however, that for cross-listed

companies, the post-trade news, and particularly earnings announcements, appear to be immaterial ($0.001, p = 0.78$), but the abnormal returns of board change, forecast and ownership are all positive and significant. It could be that these later three pieces of price-sensitive information may not be expected by the insiders, implying that the insider buy trades in cross-listed companies do not precede material news announcements. In contrast, for the domestically-listed companies, all news announcements disclosed after the buy trades are positive and significant, with the exception of forecasts that are negative and significant, and miscellaneous that is insignificant. The last column indicates that the vast majority of news announcements disclosed by domestically-listed firms generate significantly larger abnormal returns than the cross-listed companies. In sum, these results suggest that the bonding hypothesis is 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.

Table 6, Panel B., reports 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 0.011 ($p = 0.00$). These positive and significant returns are observed for the majority of news types. Similar results are obtained for cross-listed and domestically-listed companies, although the abnormal returns are larger and more significant for the later firms. In line with the results for the buy trades reported in Panel A., these results suggest that managers sell stock in their companies after announcing good news and their trades do not necessarily signal market undervaluation. Interestingly, over the event period $[-1, +1]$ the average abnormal returns are positive and significant for both sets of companies. In the post-event period $[+2, +40]$ the abnormal returns of news announcements are negative but not significant, suggesting that insiders of both cross-listed and domestically-listed companies refrain from trading on insider information, probably to protect themselves from more severe legal consequences associated with sell trades.²⁴ However, there are some bad and other good news categories, suggesting that insiders do not always sell when they expect bad news, suggesting 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.²⁵

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 actually issuing pessimistic forecasts so that analysts revise down their forecast and they meet or beat the reduced expectations. Table 6, Panel A., shows that, for the sample as a whole, the management forecast are negative in the pre-event period ($-0.131, p = 0.00$) and in the event period ($-0.177, p = 0.00$) but the earnings announcements are positive in the post-event period ($0.005, p = 0.03$) while the forecast are negative ($-0.022, p = 0.00$). Similar results are observed for the two sets of firms, but for the cross-listed companies the earnings announcements are not statistically significant ($0.001, p = 0.28$), while the forecasts are positive ($0.011, p = 0.02$). The overall results suggest that 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. For the sell trades, the forecasts in the pre- and event periods are not statistically significant for the sample as a whole and for domestically-listed companies, but, for cross-listed companies, they are positive ($0.031, p = 0.07$) in the pre-event and negative in the post-event period ($-0.031, p = 0.00$). These results are, however, mixed as the earnings announcements are positive in each period.

[Insert Table 6 here]

4.7. *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 $-0.002, p = 0.73$ for sell), but they are negative and significant prior to the buy trades ($-0.072, p = 0.00$) and positive ($0.065, p = 0.00$) before the sell trades. In the post-event period, they are positive after the buy ($0.022, p = 0.00$), but not significant after the sell ($0.002, p = 0.23$). Similarly, the results for the domestically-listed companies mirror the findings

reported in Table 3, Panel A. For example, the event period abnormal returns for the buy and sell trades are (p -values are in brackets) 0.013 (0.00) and -0.003 (0.07). The pre-event abnormal returns are -0.075 (0.00) and 0.090 (0.00), and, in the post-event period, they amount to 0.025 (0.00) and -0.009 (0.06). 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.

We also checked for the size differences between the two samples as Table 2 reports that cross-listed companies are, on average, larger than domestically-listed companies. This size difference could imply that the differences in abnormal returns between the cross-listed and the domestically-listed companies is related to the size effect rather than to the bonding hypothesis as Lakonishok and Lee (2001) find that most significant abnormal returns are associated with smaller companies. We try to mitigate this effect by constructing a control sample by matching cross-listed and domestically-listed companies by size (year-end market value of equity). We find that the cross-listed companies are mostly large and we are unable to match each cross-listed company with a domestically-listed company of the same size.²⁶ Nevertheless, we include in the control sample the largest companies and proceed with event study for this control sample.²⁷ The results are similar to the results obtained for the full sample. Table 2, Panel B., reports also that domestically-listed companies have higher market-to-book and profitability. To account for these and other differences, we use the Heckman two-type methodology in the following section.

4.8. *Cross-Sectional Regression Analysis*

In this section, we explain the differential market reaction to insider trading in cross-listed and domestically-listed companies, after accounting for fundamental differences between the two groups, by running a set of regressions where the dependent variables are the abnormal returns in the pre-event period [-40, -2], in the event date [-1, +1] and in the post-event period [+2, +40], against a number of explanatory variables. We check for multicollinearity by running the regression with one independent variable. We also account for time and industry effects using dummies. We first provide the OLS regression results in Table 7. In addition to cross-listing

dummy variable (*Cross-listing*), we report the coefficients of the impact of news announcements that happen at the same time as the insider-trading event (*Corporate News Confounding with IT*) and a cross product between *Corporate News* and dummy for cross listing (*Corporate News Confounding with IT*CL*).²⁸ We also include a set of variables to control for other fundamental differences discussed in Table 2, and a dummy to capture the job title of the trader. The first four columns indicate that the cross-listing dummy is, in general, not statistically significant for both buy and sell trades, suggesting that, as reported in Table 3, Panel A., the abnormal returns in the pre-event period are relatively similar between the two sets of firms. Although the corporate news are statistically significant, the cross product between news and cross-listing, *Corporate News Confounding with IT*CL*, is only significant in sell trades, suggesting that the impact of news on the CARs of insider trading is higher for the sell trades in domestically-listed companies but similar between the two groups in the buy trades.

The next four columns report the results for the event period [-1, +1]. Consistent with the findings reported in Table 3, Panel A., the results indicate that the difference in the event date abnormal returns between cross-listed and domestically-listed companies is only observed for the buy trades. In line with the results reported in Table 6, the impact of news appears to be statistically significant for both buy and sell trades but this effect is stronger in the case of domestically-listed companies as *Corporate News Confounding with IT*CL* is negative and significant. The coefficient of multiple trade variables are positive for the buy and negative for the sell, suggesting that insider convey more information to the market when they do not trade in one single block. Interestingly, the market reaction does not depend on the job title of the trader as none of the dummies for the chairman, CEO, CFO and other directors is significant.

The last four columns provide the results for the post-event abnormal returns. The cross-listing dummy is negative for the case of buy and positive for sell, suggesting that the post-event abnormal returns of domestically-listed firms increase (decrease) more after the buy (sell) trades. The impact of news is still significant but this effect is significantly lower for the cross-listed firms in buy trades but similar in sell trades. Overall, these results are consistent with the findings reported in Table 6. Moreover, the coefficients of the value of the trades and the multiple trades per day are positive for buy and negative for sell, implying that the market is under-reacting to these effects.

[Insert Table 7 here]

Although these results reinforce our main findings in Table 3 that the information content of insider trading is stronger in the case of domestically-listed companies, they may still be driven by fundamental differences between the two sets of companies. To account for this potential endogeneity problem, we use the Heckman-type procedure. Table 8 reports the first step, i.e., the logit regression where the dependent variable is equal to one for cross-listed and zero for domestically-listed firms. The results confirm our findings in Table 2 and indicate that cross-listed companies are, on average, larger and have a higher return on assets and market-to-book. Table 9 reports the results of the second step Heckman-type regression results including λ to account for the factors that drive cross-listing. With the exception of regressions (2) and (8), λ is significant in all regressions, suggesting that the OLS results are biased and that the Heckman procedure is more efficient. However, this bias is not severe when the dependent variable is $CAR_{40,-2}$, as the results reported in the first four columns of Table 9 are relatively similar to the OLS results in Table 7, and indicate that the abnormal returns of cross-listed firms are relatively similar to those of domestically listed companies, but that the news has a significant impact on the CARs, but this effect is more pronounced for domestically-listed companies in the case of sell trades.

Unlike the results in Table 7, the relation between the insider trading event period abnormal returns and the cross-listing dummy is weak, suggesting that, after accounting for fundamental differences between the two sets of firms, the market reacts in the same way to insider trading announcements in cross-listed and in domestically-listed firms. However, in line with the results in Table 7, the impact of news announcements is stronger for the domestically-listed firms, as the cross product of news and cross-listing, *Corporate News Confounding with IT*CL*, is negative and significant. Finally, consistent with the findings in Table 3 and Table 7, the last four columns show that the post-event abnormal returns decrease (increase) less after the sell (buy) trades and the impact of news announcements is stronger in the domestically-listed firms. However, the magnitude of the coefficients is larger than the results in Table 7 and the variable *Corporate News Confounding with IT*CL* is not significant for the sell trades, in line with the relatively low statistical difference between the two sets of firms, reported in Table 6, Panel B. The remaining results are similar to Table 7.

Overall, the results confirm our previous findings that insiders trade on private information but that this trading strategy is more prevalent in domestically-listed firms and is limited to buy trades. 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 their trading on insider information, suggesting that the bonding contract limits the propensity of these managers to gain private benefits from insider information. However, this bonding constraint appears to mitigate insider trading on private information only in the case of buy, not sell, trades. We conjecture that such differential findings may result from a potential asymmetric effect of possible expropriation. The expropriation may be more severe in case of sells when insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in losing stocks. On the other hand the expropriation in case of purchases is less harmful when both insiders and outsiders gain from the price increase.

[Insert Table 8 and Table 9 here]

5. Conclusions

The paper examines the implications of the differences between UK and US regulatory systems and test the hypothesis that, as in Coffee (1999), Reese and Weisbach (2002), Doidge (2004) and Doidge, Karolyi and Stulz (2004), foreign companies listed in the US agree to submit to tougher governance rules and pre-commit to extract less private benefits. We consider the insider trading activity as a way of extracting private benefits. 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 the event period and post-event period abnormal returns of insider trading in cross-listed companies to be significantly lower than those of domestically-listed firms, if the legal bonding mitigates their propensity to trade on price sensitive information. We also test this hypothesis by assessing the type and the price sensitivity of the information released by the two sets of companies in the pre- and post-event insider trading periods. If both sets of firms comply with the insider trading legislations, their insiders should not trade before material information is released. If there are such cases, then the information released by cross-listed firms after the trades should be immaterial.

We use a large dataset that includes 13,529 observations made by 928 UK companies, over the period January 1999 to December 2003. On average, 18% of these insider trades are in cross-listed companies and roughly 78% of the events in both sets of companies are buy trades. 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. Overall, the results show that insider trading in cross-listed companies is significantly less profitable than in companies listed domestically. Furthermore, the analysis of the news released before and after insider trading provides further 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.

We expand this analysis to account for the endogeneity problem driven by some fundamental differences between the two samples. We find lower post-buy abnormal returns and higher post-sell abnormal returns in cross-listed companies, suggesting that, after the buy (sell) share prices increase (decrease) less in cross-listed companies. We also document that the information effect of the buy trades is lower in cross-listed companies for the buy trades while for the sell trades, we find not difference between the two sets of firms, suggesting that the bonding effect is only prevalent in buy, not sell, trades. We argue that such differential market reaction is likely to reflect the asymmetric effect of possible expropriation by insiders, which may be more severe in case of sells, when insiders cash out in the anticipation of bad news leaving the uninformed investors in long positions in losing stocks. In contrast, the expropriation in case of purchases is less harmful because both insiders and outsiders gain from the stock price increase, but these gains appear to be lower in cross-listed companies.

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), Segal (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.

Appendix A - News classification

Board change: auditor appointment, board changes, financial advisor appointment, management appointment, other appointments, stock broker appointment, 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)

Ownership: block holding, ownership changes, script dividends, block listing, acquisition of interests, interest in shares, major interest in shares, sale of interests, share transfer, warrants, rule8, patents etc., litigation

General business news: agreement, award/cancellation of contract, labour 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),

Miscellaneous news: other, FRN variable rate fix, circ to shareholders, stabilisation notice, form8, share price movement, share price, pricing supplement

Other news: Any news observation with a news without name

Appendix B – Description of the Heckman procedure

The set of regression models under the Heckman procedure are:

$$CAR_i = \alpha + \underline{B}' \underline{X}_i + \delta CrossListing_i + \varepsilon_i \quad (3)$$

$$CrossListing_i^* = \underline{\gamma}' \underline{W}_i + \xi_i \quad (4)$$

Assumptions:

$$\varepsilon_i \text{ are } N(0, \sigma^2)$$

$$corr(\varepsilon_i, \xi_i) = \rho$$

where CAR_i represents CARs, \underline{X}_i are exogenous independent variables used to explain CAR_i , and $CrossListing_i$ is a dummy variable that equals one for cross-listed companies, and zero, otherwise. The estimated parameter δ measures the association between cross-listing and CAR . \underline{W}_i represents a set of determinants that can potentially influence the decision to cross-list and includes: *Size* proxied by market capitalisation, *Profitability*, the ratio of earnings before interest and tax over total assets, and *M/B*, the market-to-value book of equity. The decision to cross-list is made according to the following rule:

$$CrossListing_i = \begin{cases} 1, & \text{if } CrossListing_i^* > 0 \\ 0, & \text{if } CrossListing_i^* \leq 0 \end{cases} \quad (5)$$

The variable $CrossListing_i$ is assumed to result from an unobservable variable $CrossListing_i^*$. The correlation between $CrossListing_i^*$ and ε_i is nonzero if \underline{W}_i , the set of exogenous variables in the model (4), affects CAR_i , but are not in model (5), or if the residuals, ε_i and ξ_i , are correlated. Equations (3) and (4) are estimated using the Heckman (1979) approach. Under the above assumptions, the expected value of CAR_i for a cross-listed company is:

$$E(CAR_i | CrossListing_i = 1) = \alpha + \underline{B}' \underline{X}_i + \delta + \rho \sigma_\varepsilon \lambda_{i1}(\underline{\gamma}' \underline{W}_i) \quad (6)$$

$$\lambda_{i1}(\underline{\gamma}' \underline{W}_i) = \phi(\underline{\gamma}' \underline{W}_i) / \Phi(\underline{\gamma}' \underline{W}_i) \quad (7)$$

where $\lambda_{i1}(\underline{\gamma}' \underline{W}_i)$ is the ‘inverse Mills’ ratio’, $\phi(\cdot)$ and $\Phi(\cdot)$ are the density functions and cumulative distribution functions for the standard normal, respectively. The expected value of CAR_i for a domestically listed company is:

$$E(CAR_i | CrossListing_i = 0) = \alpha + \underline{B}' \underline{X}_i + \rho \sigma_\varepsilon \lambda_{i2}(\underline{\gamma}' \underline{W}_i) \quad (8)$$

$$\lambda_{i2}(\underline{\gamma}' \underline{W}_i) = -\phi(\underline{\gamma}' \underline{W}_i) / [1 - \Phi(\underline{\gamma}' \underline{W}_i)] \quad (9)$$

The difference in the abnormal returns (CAR) gained by insiders in cross-listed and domestically listed companies is:

$$\begin{aligned} E(CAR_i | CrossListing_i = 1) - E(CAR_i | CrossListing_i = 0) = \\ = \delta + \rho \sigma_\varepsilon \phi(\underline{\gamma}' \underline{W}_i) / [\Phi(\underline{\gamma}' \underline{W}_i)(1 - \Phi(\underline{\gamma}' \underline{W}_i))] \end{aligned} \quad (10)$$

Model (10) presents the direction of the potential bias in the OLS estimator for δ in the model (3) because it depends on the sign of the correlation of the error terms ρ . If the correlation is negative, as hypothesized for buys in cross-listed firms, then δ is biased downward. If the correlation is positive, as hypothesized for sells in cross-listed firms then δ is biased upward. In the first step the Heckman procedure estimates $\underline{\gamma}$ using a logit model. Next, these consistent estimates are used to calculate λ_{i1} and λ_{i2} . In the second step, the procedure estimates model (3) using OLS with additional term λ_i , to correct for the selection bias.

$$\lambda_i = \lambda_{i1}(\underline{\gamma}' \underline{W}_i) CrossListing_i + \lambda_{i2}(\underline{\gamma}' \underline{W}_i)(1 - CrossListing_i) \quad (11)$$

$$CAR_i = \alpha + \underline{B}' \underline{X}_i + \delta CrossListing_i + \delta_\lambda \lambda_i + v_i \quad (12)$$

Parameter δ_λ is associated with $\rho \sigma_\varepsilon$ and captures the sign of the correlation between the residuals in models (3) and (4). (See Greene, 2003, for further details).

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Table 1. Legal Aspects of Insider Trading in the UK and US

Aspect	UK	US
Legal Acts on Insider Trading	<p>The Companies Act 1985 under Section 324 and 328</p> <p>The Code of Market Conduct</p> <p>The Model Code of the London Stock Exchange 1977</p> <p>The UK Misuse of Information Act</p> <p>The Criminal Justice Act</p> <p>The Listing Rules of the London Stock Exchange (Source Book August 2002, Chapter 16)</p>	<p>The Securities Act 1933</p> <p>The Securities and Exchange Act 1934 under Section 16(b) ('short-swing' sales^a) and 10(b)5 (trading on material non-public information)</p> <p>Rule 10b-5 implements the Section 10(b)5</p> <p>Rule 10b5-1 addresses <i>The Disclose or Abstain Rule</i></p> <p>Rule 10b5-2 addresses <i>Misappropriation Theory</i></p> <p>Rule 14e-3 addresses 'constructive insider' issue</p> <p>The Insider Trading Sanctions Act 1984</p> <p>Insider Trading and Securities Fraud Enforcement Act 1988</p>
Insider Trading and Director Deal	<p><i>Insider Trading</i> 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.</p> <p><i>Director Deal</i> (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.</p>	<p><i>Insider Trading</i> 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.</p>
Insider Definition	<p>Insider is 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 relation with an insider and thus possess insider information (e.g. spouse, child).</p>	<p>Insider is a person possessing inside information about the issuer:</p> <p>'officers, directors, other key employees and shareholders holding more than 10% of any equity class'</p> <p>'<i>Officer</i>: 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., 2005)</p> <p><i>Constructive Insiders</i>: outsiders working for the company and having an access to 'material' and 'non-public' information as described in the Rule 14e-3 (e.g. an underwriter, accountant, lawyer, and consultant).</p>

		Family members or other individuals who
Table 1. Continued		
Aspect	UK	US
Insider Definition cont'd		are in non-business relation with an insider and thus possess insider information (e.g. spouse, child)
Inside Information	Inside information is 'material, current, reliable, not available to the market, and qualified as new and fresh' (The Misuse of Information Act).	Inside information is 'material' and 'non-public' of two principal forms: <i>Inside information</i> – affects company's assets and earnings and comes from internal corporate sources. <i>Market Information</i> – 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	<i>Trading Ban Period</i> - Insiders are prohibited from trading before release of price sensitive information about earnings announcements to the market. The trading ban pertains to insider trading within two months before preliminary, interim, or final earnings announcements and within one month before quarterly earnings announcements. <i>Permission for trading from the chairman of the board</i> - When not during the ban period, director needs permission for trading from the chairman of the board.	<i>The Disclose or Abstain Rule</i> – Insiders both 'true' and 'constructive', who possess material, non-public inside information must disclose the information before trading or refrain from trading until the news is disseminated. <i>Misappropriation Theory</i> considers a situation 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'. <i>Rule 14e-3</i> 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 within three days after the trading is reported by the director.	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	Insider trading law is a common law established in 1934. The regulations have evolved over time and benefited from

enforcement power, however the

different law cases rather than statutory

Table 1. Cont'd

Aspect	UK	US
Evolution of the regulations cont'd	responsibility for regulations and enforcement were spilt between different 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.	interpretation of the 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	<i>Quality of Insider Trading Law Index</i> : 3 (on the scale 0 to 4). ^b	<i>Quality of Insider Trading Law Index</i> : 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	<i>FSA Annual Reports</i> Enforcement insider trading cases initiated by FSA: 2003 – 30 ^c <i>Enforcement Indices</i> ^c <i>Public Enforcement Power Index</i> ^f : 0.63 <i>Private Enforcement Power Index</i> ^b : 0.00	<i>SEC Annual Reports</i> 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 <i>Enforcement Indices</i> ^c <i>Public Enforcement Power Index</i> ^f : 1.00 <i>Private Enforcement Power Index</i> ^b : 10.00

^a Short swing trades are described as buy (sale) trade followed by sale (buy) trade that occur within six months. ^b source Beny (2004). ^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 (2005), Beny (2004), and Bhattacharya and Daouk (2002) for more detail analysis on enforcement of insider trading law on a cross-country level. ^f source La Porta (2005)

Table 2. Descriptive Statistics

	All Companies		Cross-Listed Companies (CL)		Domestically-Listed Companies (DL)		t CL – DL	Mann-Whitney
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A Insider Trading (All Observations)								
Buy Trades								
Value of Trade (£m)	0.063	0.011	0.053	0.010	0.065	0.012	-1.21	0.000
Holding [%]	2.02%	0.06%	1.42%	0.01%	2.16%	0.09%	-2.97	0.000
Change in Holding [%]	51.92%	15.00%	55.00%	17.00%	51.18%	14.00%	0.98	0.128
Shares Traded	0.09%	0.01%	0.01%	0.00%	0.10%	0.01%	-6.27	0.000
Trades per Day	2.33	1.00	2.95	2.00	2.19	1.00	13.37	0.000
Observations	10,540	10,540	1,966	1,966	8,574	8,574		
Sell Trades								
Value of Trade (£m)	0.97	0.08	1.36	0.09	0.90	0.08	0.73	0.452
Holding [%]	3.62%	0.47%	1.40%	0.04%	3.99%	0.57%	-7.13	0.00
Change in Holding [%]	-22.94%	-11.00%	-26.60%	-11.00%	-22.37%	-11.00%	-1.92	0.65
Shares Traded	0.34%	0.03%	0.22%	0.00%	0.36%	0.04%	-1.56	0.00
Trades per Day	1.85	1.00	1.75	1.00	1.87	1.00	-1.62	0.436
Observations	2,989	2,989	433	433	2,556	2,556		
Panel B Fundamentals (Firm-Years)								
Buy Trades								
Market Cap (£m)	4,339	211	19,512	4,845	871	143	18.77	0.00
Dividend Yield	5.13	4.22	5.00	3.91	5.17	4.28	-1.10	0.00
M/B	3.33	1.55	7.78	1.99	2.31	1.41	2.18	0.00
ROA	0.02	0.01	0.03	0.04	0.02	0.01	4.71	0.00
Sell Trades								
Market Cap (£m)	3,172	212	18,011	5,642	639	170	10.27	0.00
Dividend Yield	3.18	2.41	2.97	2.45	3.22	2.40	-0.94	0.36
M/B	5.62	2.46	19.56	3.07	3.25	2.25	1.78	0.00
ROA	0.03	0.02	0.07	0.07	0.03	0.02	11.41	0.00
Panel C Distribution of average number of trades per month by sample periods and job title of the trader								
	Cross-Listed Companies				Domestically-listed Companies			
	Bull Period Jan 1999-Mar 2000		Bear Period Apr 2000-Dec 2003		Bull Period Jan 1999-Mar 2000		Bear Period Apr 2000-Dec 2003	
	N	%	N	%	N	%	N	%
Buy	39.73	100%	30.44	100%	173.40	100%	132.76	100%
Chairman	3.87	10%	4.91	16%	24.87	14%	26.02	20%
CEO	5.27	13%	3.84	13%	21.93	13%	20.60	16%
CFO	2.47	6%	2.07	7%	12.00	7%	14.82	11%
Other directors	2.20	6%	2.29	8%	9.53	5%	8.60	6%
Not reported	25.93	65%	17.33	57%	105.07	61%	62.71	47%
Sell	10.27	100%	6.22	100%	61.27	100%	36.44	100%
Chairman	1.27	12%	0.93	15%	8.40	14%	7.07	19%
CEO	0.67	7%	0.69	11%	7.00	11%	5.40	15%
CFO	0.87	8%	0.44	7%	4.20	7%	2.60	7%
Other directors	0.33	3%	1.02	16%	5.20	8%	4.76	13%
Not reported	7.13	70%	3.13	50%	36.47	60%	16.64	46%

Table 2. Continued

Panel D. Distribution of average number of trades per month by sample periods and industry

	Cross-Listed Companies				Domestically-listed Companies			
	Bull Period		Bear Period		Bull Period		Bear Period	
	Jan 1999-Mar 2000		Apr 2000-Dec 2003		Jan 1999-Mar 2000		Apr 2000-Dec 2003	
	N	%	N	%	N	%	N	%
Buy	39.73	100%	30.44	100%	173.40	100%	132.76	100%
Resources	3.60	9%	2.84	9%	5.80	3%	2.80	2%
Basic industries	4.80	12%	2.53	8%	20.53	12%	12.82	10%
General industrials	2.67	7%	3.16	10%	22.20	13%	13.11	10%
Cyclical consumer goods	0.27	1%	0.36	1%	9.60	6%	5.11	4%
Non-cyclical cons goods	7.67	19%	2.82	9%	16.93	10%	11.51	9%
Cyclical services	7.27	18%	7.58	25%	49.73	29%	43.09	32%
Non-cyclical services	4.73	12%	3.18	10%	3.93	2%	4.96	4%
Utilities	2.33	6%	1.71	6%	2.40	1%	0.98	1%
Information technology	0.13	0%	0.53	2%	5.80	3%	12.71	10%
Financials	6.27	16%	5.73	19%	36.47	21%	25.64	19%
Sell	10.27	100%	6.22	100%	61.27	100%	36.47	100%
Resources	0.33	3%	0.49	8%	1.07	2%	3.33	9%
Basic industries	0.27	3%	0.31	5%	3.93	6%	2.84	8%
General industrials	0.13	1%	0.18	3%	4.47	7%	3.33	9%
Cyclical consumer goods	-	0%	0.02	0%	2.20	4%	0.38	1%
Non-cyclical cons goods	2.47	24%	1.53	25%	5.07	8%	4.33	12%
Cyclical services	3.13	31%	1.20	19%	22.60	37%	8.71	24%
Non-cyclical services	0.73	7%	0.42	7%	1.40	2%	3.58	10%
Utilities	0.20	2%	0.40	6%	0.27	0%	2.07	6%
Information technology	0.80	8%	0.29	5%	8.40	14%	0.78	2%
Financials	2.20	21%	1.38	22%	11.87	19%	7.11	20%

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. Value of Trade is expressed in Sterling Pounds and denotes number of shares traded times a share price. Holding in Company is an insider's ownership in his or her company after the trade. Change in Portfolio is a ratio of numbers of shares traded to the number of shares held by insider prior to 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. Panel B. reports the financial characteristics of our sample firms. 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. In panel C and Panel D., we report the distribution of our sample firms by the identity of the trader and industry, and by bull and bear periods trades.

Table 3. Distribution of the Cumulative Abnormal Returns over the event windows

	All Companies	Cross-Listed (CL)	Domestically Listed (DL)	t-test CL - DL
<i>Panel A Announcement Day – All events</i>				
<i>Number of Observations</i>				
Buy	10,541	1,966	8,575	
Sell	2,994	434	2,560	
<i>CARs (-1, +1)</i>				
Buy	0.013 ^{***}	0.002	0.015 ^{***}	7.15 ^{***}
Sell	-0.005 ^{***}	-0.003	-0.005 ^{***}	-0.70
<i>CARs (-40, -2)</i>				
Buy	-0.048 ^{***}	-0.050 ^{***}	-0.047 ^{***}	0.52
Sell	0.056 ^{***}	0.046 ^{***}	0.058 ^{***}	1.36
<i>CARs (+2, +40)</i>				
Buy	0.046 ^{***}	0.030 ^{***}	0.049 ^{***}	4.14 ^{***}
Sell	-0.030 ^{***}	0.002	-0.036 ^{***}	-3.74 ^{***}
<i>Panel B Announcement Day – Excluding confounding events</i>				
<i>Number of Observations</i>				
Buy	5,893	974	4,919	
Sell	2,036	282	1,754	
<i>CARs (-1, +1)</i>				
Buy	0.010 ^{***}	0.001	0.012 ^{***}	4.92 ^{***}
Sell	-0.004 ^{***}	-0.001	-0.004 ^{***}	-1.21
<i>CARs (-40, -2)</i>				
Buy	-0.028 ^{***}	-0.034 ^{***}	-0.027 ^{***}	0.97
Sell	0.047 ^{***}	0.039 ^{***}	0.048 ^{***}	0.88
<i>CARs (+2, +40)</i>				
Buy	0.039 ^{***}	0.023 ^{***}	0.043 ^{***}	3.25 ^{***}
Sell	-0.029 ^{***}	-0.007	-0.032 ^{***}	-2.50 ^{**}

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 -220 to -41 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 news that occur over the [-5 to +5] period. Cross-listed companies are UK companies listed in the US. Domestically listed companies are UK companies listed only in the UK. ^{***}, ^{**}, ^{*} denote significance at the 0.01, 0.05 and 0.1 level, respectively.

Table 4. Difference between Announcement Day and Trading Day

	All Companies	Cross-Listed (CL)	Domestically Listed (DL)	t-test CL – DL
Panel A. Trading Day – All events				
<i>Number of Observations</i>				
Buy	10,540	1,966	8,574	
Sell	2,989	433	2,556	
<i>CARs (-1, +1)</i>				
Buy	0.007***	-0.002	0.009***	4.91***
Sell	0.001	0.005*	0.000	-2.06**
<i>CARs (-40, -2)</i>				
Buy	-0.046***	-0.049***	-0.045***	0.85
Sell	0.056***	0.042***	0.059***	1.86*
<i>CARs (+2, +40)</i>				
Buy	0.047***	0.028***	0.052***	5.36***
Sell	-0.032***	-0.002	-0.037***	-3.51***
Panel B. Announcement Day = Trading Day				
<i>Number of Observations</i>				
Buy	2,689	447	2,242	
Sell	598	63	535	
<i>CARs (-1, +1)</i>				
Buy	0.012***	-0.004	0.015***	3.70***
Sell	0.001	0.008	0.000	-1.50
<i>CARs (-40, -2)</i>				
Buy	-0.049***	-0.068***	-0.045***	1.73*
Sell	0.067***	0.051**	0.068***	0.81
<i>CARs (+2, +40)</i>				
Buy	0.058***	0.046***	0.061***	1.79*
Sell	-0.019**	0.024	-0.024**	-3.16***
Panel C. Announcement Day > Trading Day - CAARs calculated for Trading Day				
<i>Number of Observations</i>				
Buy	7,851	1,519	6,332	
Sell	2,391	370	2,021	
<i>CARs (-1, +1)</i>				
Buy	0.005***	-0.001	0.007***	3.31***
Sell	0.001	0.005	0.000	-1.67*
<i>CARs (-40, -2)</i>				
Buy	-0.044***	-0.044***	-0.045***	-0.10
Sell	0.054***	0.041***	0.056***	1.58
<i>CARs (+2, +40)</i>				
Buy	0.043***	0.023***	0.048***	4.98***
Sell	-0.035***	-0.007	-0.040***	-2.96***
Panel D. Announcement Day > Trading Day - CAARs calculated for Announcement Day				
<i>Number of Observations</i>				
Buy	7,852	1,519	6,333	
Sell	2,396	371	2,025	
<i>CARs (-1, +1)</i>				
Buy	0.013***	0.004**	0.016***	6.28***
Sell	-0.006***	-0.005*	-0.006***	-0.40
<i>CARs (-40, -2)</i>				
Buy	-0.047***	-0.045***	-0.048***	-0.46
Sell	0.054***	0.045***	0.055***	1.04
<i>CARs (+2, +40)</i>				
Buy	0.041***	0.027***	0.045***	3.60***
Sell	-0.033***	-0.002	-0.039***	-3.17***

The table reports the distribution of the cumulative abnormal returns (CAR) around insider trades using the actual trading date as the event period. We report the results for the sample as a whole (Panel A.), when the trading and the announcement date are the same (Panel B.) and when the announcement is made after the actual trade (Panel C. and Panel D.) The CARs are computed using market model with the coefficients α and β estimated over -220 to -41 days relative to the trading date, i.e., the date of insider trading transaction. Cross-listed companies are UK companies listed also in the US. Domestically listed companies are listed only in the UK. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

Table 5. Trading Day Abnormal returns in bull and bear periods

	All Companies	Cross-Listed (CL)	Domestically Listed (DL)	t-test CL – DL
Panel A. Bull period Jan 1999-Mar 2000				
<i>Number of Observations</i>				
Buy	3,238	610	2,628	
Sell	1,090	159	931	
<i>CARs (-1, +1)</i>				
Buy	0.007 ^{***}	0.001	0.008 ^{***}	2.60 ^{***}
Sell	0.007 ^{***}	0.007	0.007 ^{**}	0.11
<i>CARs (-40, -2)</i>				
Buy	-0.023 ^{***}	-0.050 ^{***}	-0.017 ^{***}	3.82 ^{***}
Sell	0.092 ^{***}	0.059 ^{**}	0.097 ^{***}	2.51 ^{**}
<i>CARs (+2, +40)</i>				
Buy	0.031 ^{***}	0.017	0.034 ^{***}	1.92 [*]
Sell	-0.039 ^{***}	0.024	-0.050 ^{***}	-3.33 ^{***}
Panel B. Bear Period April 2000-Dec 2003				
<i>Number of Observations</i>				
Buy	7,302	1,356	5,946	
Sell	1,899	274	1,625	
<i>CARs (-1, +1)</i>				
Buy	0.007 ^{***}	-0.003	0.009 ^{***}	4.23 ^{***}
Sell	-0.003 [*]	0.004	-0.004 ^{**}	-3.20 ^{***}
<i>CARs (-40, -2)</i>				
Buy	-0.056 ^{***}	-0.049 ^{***}	-0.057 ^{***}	-1.09
Sell	0.036 ^{***}	0.033 ^{***}	0.036 ^{***}	0.34
<i>CARs (+2, +40)</i>				
Buy	0.054 ^{***}	0.033 ^{***}	0.059 ^{***}	5.29 ^{***}
Sell	-0.027 ^{***}	-0.018	-0.029 ^{***}	-1.28
Panel C. t-test of differences in abnormal returns between Bull and Bear periods				
<i>CARs (-1, +1)</i>				
Buy	0.03	-1.14	0.43	
Sell	-4.28	-0.42	-4.38 ^{***}	
<i>CARs (-40, -2)</i>				
Buy	-6.66 ^{***}	0.05	-7.20 ^{***}	
Sell	-6.64 ^{***}	-1.68 [*]	-6.41 ^{***}	
<i>CARs (+2, +40)</i>				
Buy	5.12 ^{***}	1.72 [*]	4.81 ^{***}	
Sell	1.32	-1.94 ^{**}	2.17 ^{**}	

The table reports the distribution of the cumulative abnormal returns (CAR) around insider trades announcements over the bull and bear periods. The CARs are computed using market model with the coefficients α and β estimated over -220 to -41 days relative to the announcement date. Panel C. provides the t-statistics of the differences in mean abnormal returns between the bull and bear periods. Cross-listed companies are UK companies listed in the US. Domestically listed companies are listed only in the UK. ^{***}, ^{**}, ^{*} denote significance at the 0.01, 0.05 and 0.1 level, respectively.

Table 6. News Announcements Analysis

	N		All		CL		DL		CL – DL	
	All	% CL	CAR		CAR		CAR			
Panel A. Buy transactions										
-40 to -2										
All	21,885	35%	-0.009	***	-0.006	***	-0.010	***	0.003	**
Board changes	1,837	27%	-0.001		0.005	**	-0.004	*	0.009	**
Earnings	5,436	24%	-0.008	***	-0.007	**	-0.009	***	0.001	
Forecasts	615	39%	-0.131	***	-0.047	***	-0.184	***	0.137	***
Capital structure	3,414	44%	-0.009	***	-0.007	***	-0.011	**	0.004	
Restructuring	2,987	43%	0.002	*	0.000		0.004	**	-0.005	*
Ownership	1,766	24%	-0.004	**	-0.011	**	-0.003	*	-0.008	**
General business	1,129	43%	0.002		0.001		0.003		-0.002	
Miscellaneous	2,350	37%	-0.005	**	-0.007	**	-0.004	*	-0.003	
Other	2,351	45%	-0.007	**	-0.009	**	-0.005	**	-0.004	
-1 to +1										
All	2,796	25%	-0.013	***	-0.011	**	-0.014	***	0.004	
Board changes	204	24%	-0.011		-0.005		-0.012		0.007	
Earnings	844	15%	-0.009		-0.029	**	-0.005		-0.024	*
Forecasts	148	19%	-0.177	***	-0.076	***	-0.201	***	0.126	***
Capital structure	418	39%	0.006		0.012	**	0.001		0.010	
Restructuring	417	30%	0.017	***	0.000		0.024	***	-0.024	**
Ownership	116	17%	0.007		-0.004		0.010		-0.014	
General business	110	45%	-0.001		0.027	***	-0.024		0.051	**
Miscellaneous	283	25%	-0.021	**	0.005		-0.031	***	0.036	**
Other	256	25%	-0.023	*	-0.076		-0.004		-0.072	
+2,+40										
All	19,152	40%	0.005	***	0.001		0.007	***	-0.006	***
Board changes	1,551	29%	0.009	***	0.006	**	0.010	***	-0.005	
Earnings	2,606	36%	0.005	**	0.001		0.007	***	-0.005	**
Forecasts	607	33%	-0.022	***	0.011	**	-0.039	***	0.050	***
Capital structure	3,903	47%	0.000		-0.002		0.003	*	-0.005	**
Restructuring	2,536	47%	0.010	***	0.003		0.016	***	-0.013	***
Ownership	2,009	27%	0.005	**	0.006	**	0.005	**	0.001	
General business	1,287	49%	0.015	***	0.004		0.025	***	-0.021	***
Miscellaneous	2,481	37%	0.000		-0.004		0.003		-0.007	**
Other	2,172	43%	0.011	***	0.004		0.017	***	-0.013	***

Table 6. Continued

	N		All		CL		DL		CL – DL	
	All	% CL	CAR		CAR		CAR			
Panel B. Sell transactions										
-40 to -2										
All	5,538	30%	0.011	***	0.006	***	0.013	***	-0.007	***
Board changes	360	27%	0.010	**	0.003		0.013	**	-0.009	
Earnings	1,725	24%	0.012	***	0.006	**	0.013	***	-0.007	**
Forecasts	90	39%	-0.012		0.031	*	-0.040		0.071	**
Capital structure	718	32%	0.014	***	0.003		0.020	***	-0.017	***
Restructuring	878	31%	0.017	***	0.009	**	0.021	***	-0.012	**
Ownership	439	21%	0.003		-0.003		0.005		-0.008	*
General business	300	32%	0.023	***	0.019	**	0.025	***	-0.006	
Miscellaneous	610	36%	0.001		0.000		0.001		-0.002	
Other	418	48%	0.009	**	0.007	**	0.012	*	-0.005	
-1 to +1										
All	534	24%	0.012	**	0.011	*	0.012	**	-0.001	
Board changes	43	28%	-0.012	*	-0.021		-0.009	*	-0.012	
Earnings	193	23%	0.009		0.020	*	0.005		0.015	
Forecasts	14	21%	-0.031		-0.023		-0.033		0.011	
Capital structure	68	43%	0.019	**	0.013		0.023	**	-0.010	
Restructuring	58	9%	0.040	**	0.030		0.041	**	-0.012	
Ownership	33	12%	0.027	**	0.021		0.027	*	-0.006	
General business	31	13%	0.065	***	0.025	*	0.071	***	-0.046	**
Miscellaneous	48	29%	-0.001		-0.001		-0.001		0.000	
Other	46	24%	-0.021		0.010		-0.031		0.042	
+2,+40										
All	4,913	34%	-0.001		-0.001		-0.001		0.000	
Board changes	366	23%	-0.001		-0.001		-0.001		0.000	
Earnings	871	38%	-0.001		0.008	**	-0.006	**	0.014	**
Forecasts	135	39%	-0.014		-0.031	***	-0.003		-0.029	*
Capital structure	906	39%	-0.004	**	0.001		-0.007	**	0.008	**
Restructuring	723	34%	0.006	**	0.006	**	0.006		0.001	
Ownership	534	21%	0.001		0.000		0.001		-0.001	
General business	297	25%	0.011	**	0.004		0.014	**	-0.010	
Miscellaneous	674	36%	-0.008	**	-0.014	***	-0.005		-0.008	
Other	407	42%	-0.005		-0.009	**	-0.002		-0.007	

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 8 categories. We find 55,818 news announcements matched with 7,815 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 [-1, +1] around news releases. ***, **, * denote significance at the 0.01, 0.05 and 0.1 level, respectively.

Table 7. Regression Model of Cumulative Abnormal Returns [-40, -2], [-1, +1] and [+2, +40] around Trading Day

	[-40,-2]				[-1,+1]				[+2,+40]			
	Buy		Sell		Buy		Sell		Buy		Sell	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OLS												
Constant	0.0911 (<.0001)	0.0477 (<.0001)	0.0502 (0.0216)	0.0853 (<.0001)	0.0115 (0.0364)	0.0059 (0.1834)	0.0010 (0.8530)	0.0097 (0.0558)	0.0388 (0.0005)	0.0602 (<.0001)	0.0929 (<.0001)	0.0938 (<.0001)
Cross-Listing	-0.0146 (0.0270)	-0.0001 (0.9885)	-0.0202 (0.1068)	-0.0126 (0.2667)	-0.0103 (<.0001)	-0.0102 (<.0001)	0.0041 (0.2040)	0.0021 (0.4785)	-0.0155 (0.0042)	-0.0131 (0.0077)	0.0161 (0.1385)	0.0221 (0.0286)
Corporate News confounding with IT*CL		0.0189 (0.6394)		-0.5654 (<.0001)		-0.4150 (<.0001)		-0.1145 (0.0793)		-0.3117 (<.0001)		0.0734 (0.5996)
Corporate News confounding with IT		0.9597 (<.0001)		1.3684 (<.0001)		0.8574 (<.0001)		0.6758 (<.0001)		1.1383 (<.0001)		1.0154 (<.0001)
Value of Trade	-0.0051 (<.0001)	-0.0030 (0.0011)	-0.0011 (0.4871)	-0.0025 (0.0683)	0.0004 (0.3830)	0.0007 (0.0481)	0.0002 (0.5697)	-0.0004 (0.2044)	0.0035 (<.0001)	0.0023 (0.0037)	-0.0048 (0.0003)	-0.0048 (<.0001)
% Holding	-0.1152 (0.0065)	-0.0478 (0.1938)	-0.0296 (0.6361)	-0.0398 (0.4731)	0.0171 (0.3254)	-0.0018 (0.8976)	0.0074 (0.6453)	0.0161 (0.2655)	0.0418 (0.2312)	-0.0059 (0.8509)	0.0774 (0.1538)	0.0953 (0.0582)
% Change in Portfolio	0.0000 (0.1259)	0.0000 (0.0615)	0.0074 (0.6883)	-0.0014 (0.9341)	0.0000 (0.6410)	0.0000 (0.8382)	-0.0029 (0.5400)	-0.0051 (0.2300)	0.0000 (0.7128)	0.0000 (0.7982)	0.0017 (0.9141)	-0.0078 (0.6025)
Shares Traded	1.9492 (0.0014)	1.8876 (0.0004)	-0.2057 (0.5640)	-0.0281 (0.9292)	0.9028 (0.0003)	0.6806 (0.0008)	0.1569 (0.0870)	0.1996 (0.0156)	2.8244 (<.0001)	3.2782 (<.0001)	0.5083 (0.1005)	0.2784 (0.3320)
Multiple Trading per Day	-0.0288 (<.0001)	-0.0212 (<.0001)	0.0156 (0.0774)	0.0081 (0.3013)	0.0003 (0.8697)	0.0043 (0.0104)	-0.0072 (0.0016)	-0.0081 (<.0001)	0.0179 (<.0001)	0.0151 (<.0001)	-0.0102 (0.1846)	-0.0159 (0.0261)
Multiple Trading 30 Days	-0.0368 (<.0001)	-0.0159 (0.0007)	0.0282 (0.0083)	0.0232 (0.0143)	0.0080 (0.0003)	0.0092 (<.0001)	-0.0019 (0.4915)	-0.0011 (0.6526)	0.0244 (<.0001)	0.0208 (<.0001)	0.0004 (0.9645)	0.0000 (0.9964)
Chairman	0.0071 (0.3108)	-0.0032 (0.5991)	0.0011 (0.9255)	-0.0001 (0.9957)	0.0024 (0.3959)	-0.0002 (0.9446)	0.0038 (0.2170)	0.0028 (0.3187)	-0.0101 (0.0797)	-0.0083 (0.1122)	-0.0092 (0.3770)	-0.0087 (0.3698)

Table 7. Cont'd

	[-40,-2]				[-1,+1]				[+2,+40]			
	Buy		Sell		Buy		Sell		Buy		Sell	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OLS												
CEO	-0.0061 (0.4106)	-0.0049 (0.4418)	-0.0084 (0.5182)	-0.0135 (0.2407)	0.0019 (0.5339)	0.0001 (0.9747)	-0.0029 (0.3925)	-0.0018 (0.5536)	0.0063 (0.2980)	0.0049 (0.3716)	0.0001 (0.9939)	-0.0034 (0.7440)
CFO	-0.0059 (0.5038)	-0.0062 (0.4159)	0.0031 (0.8582)	0.0046 (0.7622)	0.0060 (0.0922)	0.0033 (0.2586)	-0.0003 (0.9402)	0.0008 (0.8381)	0.0181 (0.0120)	0.0140 (0.0315)	-0.0002 (0.9908)	-0.0078 (0.5689)
Other Top Executives	-0.0054 (0.7541)	-0.0123 (0.4078)	-0.0073 (0.7617)	-0.0061 (0.7762)	0.0037 (0.6003)	0.0047 (0.4145)	-0.0043 (0.4878)	-0.0083 (0.1365)	-0.0075 (0.5951)	-0.0040 (0.7577)	-0.0408 (0.0499)	-0.0426 (0.0274)
Other Directors	0.0059 (0.6347)	-0.0050 (0.6426)	-0.0032 (0.8413)	-0.0072 (0.6103)	0.0018 (0.7209)	-0.0052 (0.2023)	0.0004 (0.9229)	0.0007 (0.8433)	0.0093 (0.3615)	-0.0008 (0.9263)	0.0063 (0.6486)	0.0042 (0.7449)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	10,377	10,377	2,942	2,942	10,377	10,377	2,942	2,942	10,377	10,377	2,942	2,942
Adj. R2	0.0362	0.2751	0.0179	0.2271	0.0069	0.3471	0.0140	0.2024	0.0349	0.2074	0.1151	0.2401

This table presents the OLS regressions results to explain the cumulative abnormal return around insider trading announcement in the event windows [-40, -2], [-1, +1], and (+2, +40). Cross-Listing is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. *Corporate News confounding with IT*CL* is the cross product between the news and cross-listing. *Corporate News confounding with IT* is the event period abnormal returns of the news that is released in the event window of the insider trading (e.g., in the first four regressions, the *Corporate News confounding with IT* is the average abnormal returns of the news announced in the [-40, -2] insider trading period]. *Value of Trade* is the log of number of shares traded times a share price. *Holding in Company* is an insider's ownership in his or her company after the trade. *Change in Portfolio* is a ratio of numbers of shares traded to the number of shares held by insider prior to 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 (Multiple Trading 30 Days)* is a dummy variable that equals one if more than one insider trades are reported in same company at the same day (30 days). Chairman (CEO, CFO, and Other Directors) are dummy variables that equal to one if an insider is Chairman (CEO, CFO, and Other Directors) zero otherwise. Year Dummies and Industry Dummies control for year and industry effects, respectively. *P*-values are reported in parenthesis.

Table 8. First Step Heckman-Type Procedure

Constant	Size	ROA	M/B	N	Pseudo R2
-23.1057 (<.0000)	1.0422 (<.0000)	-0.1415 (<.0000)	0.0111 (<.0001)	13,360	0.5431

The table present the first step Heckman-type procedure, a logistic regression of a probability that a UK firm cross-lists in the US using fundamental variables. Size is the year-end market value of equity, *ROA* is a ratio of earnings before interest and tax over total assets, and *M/B* is the ratio of the year-end market value to book value of equity. Pseudo-R2 is goodness of fit of logistic regression model. The *p*-values are reported in parenthesis.

Table 9. Second Step Heckman-Type Regression Model of event period windows Cumulative Abnormal Returns around announcement dates of insider trading.

	[-40,-2]				[-1,+1]				[+2,+40]			
	Buy		Sell		Buy		Sell		Buy		Sell	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	0.0840 (<.0001)	0.0452 (0.0001)	0.0522 (0.0169)	0.0868 (<.0001)	0.0141 (0.0012)	0.0087 (0.0560)	0.0005 (0.9262)	0.0098 (0.0537)	0.0642 (<.0001)	0.0806 (<.0001)	0.0984 (<.0001)	0.0997 (<.0001)
λ	0.0406 (0.0033)	0.0148 (0.2202)	-0.0495 (0.0519)	-0.0396 (0.0797)	-0.0151 (0.0079)	-0.0158 (0.0006)	0.0128 (0.0508)	-0.0022 (0.7144)	-0.1471 (<.0001)	-0.1211 (<.0001)	-0.1370 (<.0001)	-0.1424 (<.0001)
Cross-Listing	-0.0311 (0.0003)	-0.0062 (0.4173)	0.0031 (0.8573)	0.0062 (0.6926)	-0.0042 (0.2351)	-0.0038 (0.1842)	-0.0019 (0.6642)	0.0031 (0.4444)	0.0443 (<.0001)	0.0365 (<.0001)	0.0808 (<.0001)	0.0890 (<.0001)
Corporate News confounding with IT*CL		0.0146 (0.7174)		-0.5733 (<.0001)		-0.4137 (<.0001)		-0.1149 (0.0783)		-0.3778 (<.0001)		0.0095 (0.9454)
Corporate News confounding with IT		0.9598 (<.0001)		1.3677 (<.0001)		0.8573 (<.0001)		0.6767 (<.0001)		1.1323 (<.0001)		1.0275 (<.0001)
Value of Trade	-0.0050 (<.0001)	-0.0030 (0.0012)	-0.0009 (0.5725)	-0.0023 (0.0892)	0.0004 (0.4020)	0.0006 (0.0532)	0.0002 (0.6617)	-0.0004 (0.2132)	0.0033 (0.0001)	0.0022 (0.0050)	-0.0042 (0.0013)	-0.0043 (0.0004)
% Holding	-0.1013 (0.0174)	-0.0427 (0.2485)	-0.0332 (0.5954)	-0.0426 (0.4423)	0.0119 (0.4950)	-0.0072 (0.6104)	0.0083 (0.6041)	0.0160 (0.2702)	-0.0086 (0.8040)	-0.0470 (0.1370)	0.0674 (0.2118)	0.0848 (0.0895)
% Change in Portfolio	0.0000 (0.1298)	0.0000 (0.0625)	0.0051 (0.7831)	-0.0032 (0.8451)	0.0000 (0.6306)	0.0000 (0.8235)	-0.0023 (0.6270)	-0.0053 (0.2218)	0.0000 (0.6584)	0.0000 (0.7470)	-0.0047 (0.7690)	-0.0145 (0.3272)
Shares Traded	2.0616 (0.0007)	1.9280 (0.0003)	-0.2874 (0.4232)	-0.0943 (0.7672)	0.8612 (0.0006)	0.6370 (0.0017)	0.1780 (0.0537)	0.1961 (0.0183)	2.4177 (<.0001)	2.9373 (<.0001)	0.2820 (0.3624)	0.0404 (0.8880)
Multiple Trading per Day	-0.0295 (<.0001)	-0.0215 (<.0001)	0.0158 (0.0744)	0.0083 (0.2930)	0.0006 (0.7665)	0.0046 (0.0063)	-0.0073 (0.0015)	-0.0081 (<.0001)	0.0206 (<.0001)	0.0174 (<.0001)	-0.0098 (0.2011)	-0.0155 (0.0281)
Multiple Trading 30 Days	-0.0373 (<.0001)	-0.0161 (<.0001)	0.0303 (0.0048)	0.0249 (0.0089)	0.0082 (0.0002)	0.0094 (<.0001)	-0.0024 (0.3781)	-0.0010 (0.6816)	0.0263 (<.0001)	0.0223 (<.0001)	0.0062 (0.5010)	0.0061 (0.4757)
Chairman	0.0075 (0.2843)	-0.0030 (0.6161)	0.0008 (0.9465)	-0.0003 (0.9754)	0.0023 (0.4252)	-0.0003 (0.8918)	0.0039 (0.2071)	0.0028 (0.3214)	-0.0115 (0.0434)	-0.0095 (0.0671)	-0.0101 (0.3301)	-0.0095 (0.3191)

Table 9. Cont'd

	[-40,-2]				[-1,+1]				[+2,+40]			
	Buy		Sell		Buy		Sell		Buy		Sell	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CEO	-0.0049 (0.5023)	-0.0045 (0.4811)	-0.0092 (0.4765)	-0.0142 (0.2181)	0.0015 (0.6277)	-0.0004 (0.8861)	-0.0026 (0.4302)	-0.0018 (0.5459)	0.0023 (0.7052)	0.0017 (0.7625)	-0.0029 (0.8386)	-0.0058 (0.5752)
CFO	-0.0045 (0.6063)	-0.0057 (0.4534)	0.0029 (0.8674)	0.0044 (0.7721)	0.0055 (0.1226)	0.0028 (0.3412)	-0.0003 (0.9496)	0.0008 (0.8396)	0.0133 (0.0638)	0.0101 (0.1189)	-0.0007 (0.9603)	-0.0085 (0.5350)
Other Top Executives	-0.0054 (0.7549)	-0.0123 (0.4079)	-0.0077 (0.7470)	-0.0064 (0.7630)	0.0037 (0.6010)	0.0047 (0.4151)	-0.0042 (0.4998)	-0.0083 (0.1354)	-0.0076 (0.5885)	-0.0039 (0.7565)	-0.0421 (0.0419)	-0.0439 (0.0219)
Other Directors	0.0062 (0.6173)	-0.0048 (0.6503)	-0.0046 (0.7713)	-0.0084 (0.5535)	0.0017 (0.7374)	-0.0053 (0.1922)	0.0008 (0.8511)	0.0007 (0.8568)	0.0082 (0.4168)	-0.0017 (0.8544)	0.0023 (0.8671)	0.0000 (0.9993)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	10,377	10,377	2,942	2,942	10,377	10,377	2,942	2,942	10,377	10,377	2,942	2,942
Adj. R2	0.0369	0.2751	0.0188	0.2277	0.0075	0.3477	0.0150	0.2022	0.0504	0.2178	0.1265	0.2524

This table presents the second step Heckman-type regressions results to explain the cumulative abnormal return around insider trading announcement in the event windows [-40, -2], [-1, +1], and (+2, +40). λ is a selectivity term computed from the logistic model (the first step Heckman-type model) and used in the second step Heckman-type regression model. *Cross-Listing* is a dummy variable that equals one if the insider trading event involves a firm that is listed in the US, zero otherwise. *Corporate News confounding with IT*CL* is the cross product between the news and cross-listing. *Corporate News confounding with IT* is the event period abnormal returns of the news that is released in the event window of the insider trading (e.g., in the first four regressions, the *Corporate News confounding with IT* is the average abnormal returns of the news announced in the [-40, -2] insider trading period]. *Value of Trade* is the log of number of shares traded times a share price. *Holding in Company* is an insider's ownership in his or her company after the trade. *Change in Portfolio* is a ratio of numbers of shares traded to the number of shares held by insider prior to 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 (Multiple Trading 30 Days)* is a dummy variable that equals one if more than one insider trades are reported in same company at the same day (30 days). Chairman (CEO, CFO, and Other Directors) are dummy variables that equal to one if an insider is Chairman (CEO, CFO, and Other Directors) zero otherwise. Year Dummies and Industry Dummies control for year and industry effects, respectively. *P*-values are reported in parenthesis.

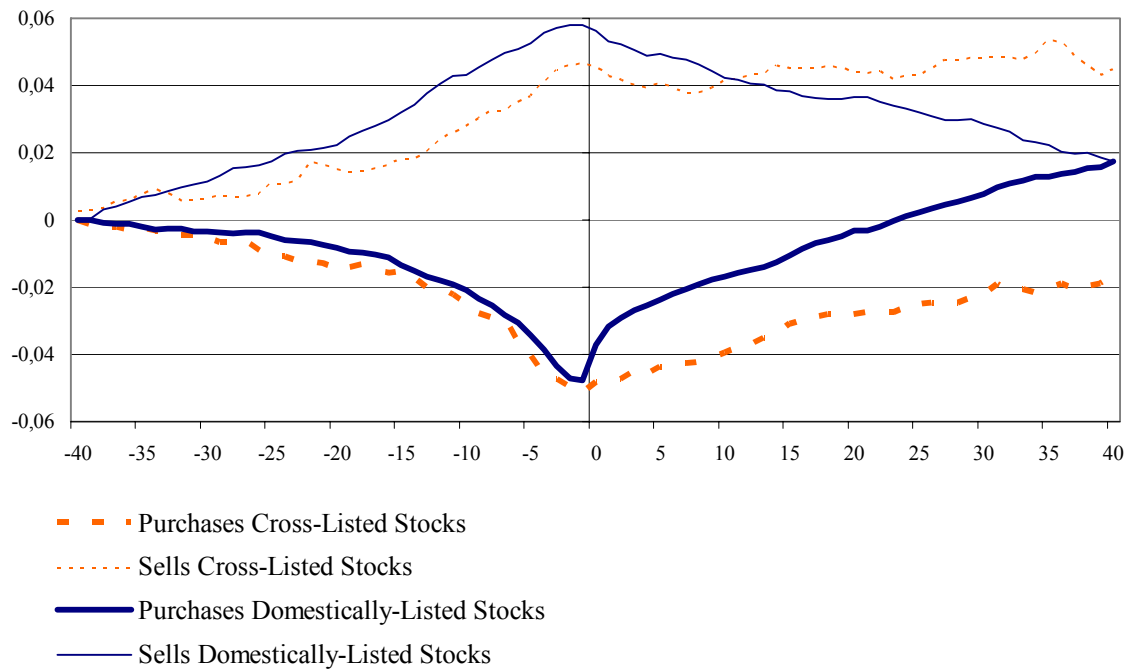


Figure 1. Cumulative Abnormal Returns around Insider Trading Announcement

The Figure presents cumulative average abnormal returns around insider trading events [-40, +40] computed using event study methodology. The market model coefficients α and β are estimated over -220 to -41 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 UK companies are the largest group of European cross-listed companies (171), primarily in the US and third largest in the world, after Canada (266) and Japan (206) (Sarkissian and Schill, 2004).

² These characteristics include the effectiveness of outside shareholder protection rights, dispersion of ownership, and common law origins that prevent insiders from taking advantage of private information.

³ We use the 40 trading day period to amounts for 60 calendar day period after the insider trading date because the UK legislation specifies that insiders cannot trade during the two months preceding a preliminary, final or interim earnings announcements and a one month prior to a quarterly earnings announcements. We detail in Section 2 these and other requirements.

⁴ However, a number of studies question the effectiveness of this bonding hypothesis. For example, King and Segal (2004) argue that cross-listing brings benefits only when the firm can convince its investors that shareholders' interests would be fully protected. Segal (2005) analyze Mexican firms cross-listing in the US market to find that 'reputational' bonding is more effective than legal bonding. He argues that the legal bonding is mainly executed through the mechanism of courts and litigation, while the content of reputational one is more diversified, including press-reporting and analysts. Licht (2003) argues that the role of bonding has been overstated in previous studies and the main motivations for firms to cross-list are attributed to the accessibility to cheaper finance and enhancement of firm's visibility and that the bonding effect holds only when the market which firms choose to cross-list provides stricter regulatory rules. He suggests that the US market fails to employ the same regulatory regime to foreign issuers as it puts on the US domestic firms.

⁵ 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, 2004; Bris, 2005; Fidrmuc et al., 2005), 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).

⁶ See Bozcuk and Lasfer (2005) for details on reporting trades in the London Stock Exchange.

⁷ The Sarbanes-Oxley Act of 2002 amended the regulations governing the reporting of insider transactions in two significant ways. First, it shortened the reporting period, requiring insiders to report transactions within 2 business days. Second, it required that all reports be filed electronically.

⁸ The IT Index takes into account prohibition from tipping outsiders by insiders about private, price sensitive information, prohibition from trading on private, price sensitive information imposed on insiders, as well as tougher potential material and criminal penalties and sanctions.

⁹ Beny (2004) 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. Thereafter, this power is delegated to the Financial Services Authority (FSA) which can impose civil fines for insider trading to increase the effectiveness of the regulations. Although the UK aims to follow US enforcement track, the existing evidence does not demonstrate a significant improvement in undertaking legal actions against insider trading.

¹⁰ According to the information available in the Factiva Database, there were only four cases of successful law enforcements since 2001 with five individuals fined with the highest penalty of £45,000 (Financial Times, April 2, 2004; December 17, 2004). In February 2004, the FSA fined £15,000 a former company secretary of Profile Media Group for selling shares in his company in April 2002, a month before disclosing a profits warning. In March 2004, it fined £45,000 a former chief executive of Sportsworld Media Group, accused for breaching Stock Exchange listing rules. In July 2004, it fined £15,000 a former spin doctor for headhunters Whitehead Mann for short selling in September 2002 before issuing negative trading statement and for selling shares in November 2002 after learning about undisclosed interim results, and resignation of the chief executive. In the fourth case, the FSA fined £18,000 and £15,000 two individuals a former equity analyst at Evolution Beeson Gregory and a former company secretary and finance director in I Feel Good for trading on mergers and acquisition, respectively in December 2004.

¹¹ Similar sample selection 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).

¹² Our size is larger than any other recent insider trading study on UK data. 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 transactions for 196 companies between October 1986 and December 1994, Hillier and Marshall (2002) use 7,796 transactions for 1,350 companies between September 1991 and March 1997 and Fidrmuc et al., (2005) use 10,140 buys and 5,523 sells in 1991-1998, including transactions such as exercise of options or derivatives.

¹³ Bank of New York and JP Morgan provide information on only the most recent programs. With the exception of the NYSE, stock exchanges do not provide information on foreign listings in the past. To complete our cross-listing sample, we check each company's web site and historical data.

¹⁴ Some of the cross-listed companies use two ways to list their ADRs, such as over the counter and stock exchange. In such a case we consider the company to be listed on the stock exchange because it implies stricter disclosure requirements.

¹⁵ See Appendix A for details on the classification of the news announcements.

¹⁶ Data availability has limited our news sample period to 2002. When we use the actual transaction dates we matched 7,822 insider trades with 54,182 news announcements.

¹⁷ 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 classified news as good or bad "if at least ten analysts judged them as such without any a priori expectations". We have also computed the statistical significance of each news type by dividing the event date abnormal returns over the standard deviation of the abnormal returns over the estimation period. The results, available upon request, are qualitatively similar.

¹⁸ In model (2) we replace dummy for cross-listing by a set of dummies that correspond to the level of cross-listing and the level of disclosure requirements imposed by Security and Exchange Commission (SEC). *OTC Listing*, and *Exchange Listing* are dummy variables and equal one if insider trading event occurs when a firm's ADRs involve OTC listing (Level I), or listing on one of the three stock exchanges Amex, Nyse or

Nasdaq, respectively and zero otherwise. The results, not reported, are qualitatively similar.

¹⁹ We were unable to obtain full data on the job title of the *Not reported* category. We assume that these missing titles are randomly distributed across the identified job titles and that they do not concern only one specific category.

²⁰ 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).

²¹ 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.

²² The results based on the announcement 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 statistically 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 from the authors upon request.

²⁴ 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”.

²⁵ We tried various event windows, including $[\pm 40, \pm 31]$ and $[\pm 30, \pm 2]$ to capture the requirement that companies should not trade one month before the news is announced, and also $[\pm 40, \pm 6]$ and $[\pm 5, \pm 2]$ to assess how quickly insiders trades before and/or after the news is announced. We find relatively similar results. For example, we find the following for buy trades in cross-listed and domestically-listed companies, respectively (p values in parentheses): $[-40, -6]$ -0.005 (0.00) and -0.007 (0.00); $[-5, -2]$ -0.023 (0.00) and -0.035 (0.00); $[+2, +5]$ 0.000 (0.99) and 0.008 (0.00); $[+6, +40]$ 0.001 (0.78) and 0.008 (0.00). The respective abnormal returns for the sell trades are: $[-40, -6]$ -0.005 (0.00) and -0.007 (0.00); $[-5, -2]$ -0.023 (0.00) and -0.035 (0.00); $[+2, +5]$ 0.000 (0.99) and 0.008 (0.00); $[+6, +40]$ 0.001 (0.78) and 0.008 (0.00)

²⁶ For example, at the end of 2003, there are about 2,200 companies quoted in the London Stock Exchange. The distribution of companies by market value reveals that 123 companies (6%) account for 83% of the total market value (i.e., £1,507bn out of £1,812bn). Given that our cross-listed companies are mainly included in the 123, it was not possible to find a size-matched control sample.

²⁷ These results are available from the authors upon request.

²⁸ For example, when the dependent variable is the insider trading $CAR_{40,-2}$, we use the average abnormal returns of the news announced over the pre-event period $[-40, -2]$.