Directors' Share Dealings and Corporate Control

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ABSTRACT
This paper contributes to the insider trading literature by exploring the impact of the blockholder structure on the information content of directors' transactions for all UK listed companies. We find that: (i) the share price reaction to directors' purchases is considerably higher than that to sales; (ii) the status of the trading director influences the share price, but the information hierarchy hypothesis is not supported; (iii) control by financial institutions reinforces the information content of directors' transactions; (iv) monitoring blockholders (corporations and individuals) as well as block ownership by directors weaken the announcement effect; (v) multiple trading emits a stronger signal to the market; (vi) the information content of directors' trades is stronger in poorly performing firms; and (vii) even by adjusting for the release of news before the trade, all of the above results are upheld.

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Executive Summary

Compared to outsiders, directors often hold superior information about their firm's current situation and its likely prospects. The exploitation of this information through insider trading raises many questions as to the fairness and efficiency of capital markets. The main argument in favour of insider trading is that it increases the information reflected in share prices and, as a result, prices more closely reflect the true value of firms.

There is a wealth of empirical studies documenting a positive price reaction to share purchases by the directors and a negative reaction to sales. The main contribution of our study is to investigate whether the share price reactions for a UK sample of directors' transactions are influenced by the firms' ownership and control structure. To the best of our knowledge no other study analysing the market response to directors' dealings has taken into account ownership and control. We argue that certain types of outside shareholders, by monitoring the firm's management, reduce the informative content of directors' trades. These types of shareholders are individuals not related to the directors and other firms. Hence, the market reaction to directors' purchases and sales in firms with these types of shareholder is likely to be less pronounced. Conversely, firms with institutional investors among their shareholders are likely to experience a more substantial price reaction. The rationale behind this hypothesis is based on conclusions drawn by previous empirical studies. These studies have found that institutional investors in the UK do not tend to monitor the firms they invest in and merely follow the trades of the directors. We find strong evidence that monitoring shareholders reduce the strength of the price reaction and that institutional investors amplify its strength.

We also find evidence of an entrenchment effect. The market reaction to further purchases by directors who already hold substantial stakes is less positive than that for purchases in other firms. This suggests that shareholders are worried that when directors' holdings exceed a certain threshold the latter may shield themselves from disciplinary actions in the wake of poor performance. Similarly, the price response to sales in firms with substantial directors' holdings is less negative.

In addition, we test whether the market reaction increases with the seniority of the director trading. For example, CEOs are expected to have the best knowledge about their firm's prospects and therefore the informational content of their trades should be highest across all the types of directors. However, we find the exact opposite. We also find that when former directors purchase shares the market reaction is largest.

For badly performing firms and those which are in financial distress, purchases by the directors cause strong, positive market responses, irrespective of the ownership and control structure.

Finally, even by adjusting for the possible release of news before the trade, the above results are upheld.

Introduction

Under asymmetric information, insiders, defined as managers and members of the board of directors of publicly traded corporations, possess more information about their company than the small shareholders. The informational advantage of insiders and its exploitation through insider trading raises many questions about the fairness and efficiency of financial markets (Leland (1992)). The importance of these questions is also highlighted by Lakonishok and Lee (2001) who document that US insiders trade frequently in the shares of their firm. Using a dataset covering all the companies traded on the NYSE, Amex, and Nasdaq over the period from 1975 to 1995, they show that there is insider trading in more than 50 percent of the stocks every year. On average, annual insider purchases (sales) amount to 0.6 percent (1.3 percent) of a company's market capitalization. However, despite being largely ignored by the market upon their announcement, insider trades earn significantly positive returns over the long term.

The main argument in favour of insider trading is that it conveys new information to outsiders. Leland (1992) shows that when insider trading is allowed, share prices are higher and incorporate more information. Although an insider purchase conveys positive information about the firm's prospects, it is less clear what information is conveyed by an insider sale. On the one hand, an insider sale conveys bad information about the firm's prospects. On the other hand, an insider sale may be less informative given that the sale may be made for liquidity needs rather than the insider's belief that the firm's future value will be lower than anticipated by the market. Also, an insider may sell after the exercise of stock options which are part of his remuneration package. These option-related sales are likely to be less informative. A vast body of empirical literature confirms these predictions. Seyhun (1986), Lin and Howe (1990), and Chang and Suk (1998) report positive abnormal returns on insider purchases for the US. King and Röell (1988), Pope, Morris and Peel (1990), Gregory, Matatko, Tonks and Purkis (1994), and Gregory, Matatko and Tonks (1997) find positive abnormal returns for the UK over horizons of 6 to 12 months following directors' purchases. A more recent UK study by Friederich, Gregory, Matatko and Tonks (2002) on daily

share prices corroborates these findings for short-term horizons. Our paper contributes to the existing literature by exploring the impact of corporate control on the information content of insider trades and by adjusting for releases of news items before the trades.

The definition of insider trading frequently causes confusion. We adopt the legal definition of the UK. Insider information is, according to the Misuse of Information Act, information that is 'material, current, reliable and not available to the market' and is legally qualified as 'new and fresh'. The Criminal Justice Act makes trading on insider information (information not regularly available and obtained through insiders) a legal offence. Our paper does not deal with illegal insider trading, but focuses on legal trading by directors as defined in the listing rules of the London Stock Exchange (Source Book August 2002, Chapter 16). Whereas in the UK there is a distinction between (illegal) insider trading and (legal) directors' dealings, the US regulation does not make such a distinction. We also adopt the UK definition of a director. In the UK, the term director covers both non-executive and executive directors. Conversely, in the US, executives are normally referred to as officers and non-executives as directors.

We analyse the immediate market reaction to directors' transactions (excluding sales after the exercise of options) for companies listed on the London Stock Exchange from 1991 to 1998. Our results support previous findings that directors' trades convey new information on the firm's prospects.

More importantly, however, our study constitutes a substantial innovation to the existing literature. Our main contribution is to analyse the impact of corporate control on the information content of directors' dealings. To the best of our knowledge, no other study has explored the impact of the presence of different types of blockholders on the announcement effect to directors' transactions. We argue that the market takes into account all available public information – including the firm's control characteristics – when reacting to insider transactions. For example, directors' trades in firms with outside blockholders who monitor the firm may have relatively less informational value

than directors' trades in widely held firms which may suffer from higher informational asymmetry. Our analysis thus provides new evidence on the market's perception of corporate control.

Our results confirm that the market takes into account the firm's control structure when reacting to directors' trades. The market reaction differs depending on the degree of outside and director ownership, as well as the degree of institutional and other outsider ownership. Firms, mainly owned by other firms or by individuals unrelated to the directors, experience lower cumulative average abnormal returns (CAARs) in absolute value. This suggests that monitoring by these blockholders insures value maximization and reduces informational asymmetry, and that directors' trades convey less information. In contrast, firms mainly owned by institutional investors have on average higher CAARs. This confirms the findings by Franks, Mayer and Renneboog (2001) and Faccio and Lasfer (2002) that British institutional shareholders do not monitor the firms they invest in and do not mitigate problems of asymmetric information.

Our results also confirm that markets take into account directors' entrenchment when reacting to directors' trades. For firms whose directors hold large stakes, the positive news contained in directors' purchases is mitigated by the danger of increased entrenchment. Similarly, the market reacts less negatively when directors with significant stakes sell as this reduces their entrenchment.

For firms which are performing poorly or are close to financial distress, we find stronger market reactions to directors' dealings. The signal of directors' purchases (sales) is then significantly positive (negative) irrespective of the shareholder structure.

We fail to find support for the information hierarchy hypothesis (Seyhun (1986)). Although CEOs are assumed to have the best knowledge about their company's prospects, the information content of CEO trades is lower than that of other directors. Moreover, when former directors purchase shares, the market reaction at the announcement is larger than that of purchases by other directors. Conversely, the market does not react to sales by former directors as these sales may be related to personal wealth diversification or liquidity needs.

The remainder of the paper is organized as follows. The next section summarises the UK regulation on directors' dealings and compares it to the US regulation. Section 3 develops the hypotheses and embeds them in the existent literature. Section 4 describes the data and discusses the methodology. Section 5 analyses the results. Section 6 concludes.

I. UK and US regulation on insider transactions

In the US, insider trading is regulated by the Securities Exchange Commission (SEC). The 1934 Securities and Exchange Act and its amendments impose restrictions on insider trading. Officers,[1] directors, and other key employees are prohibited from trading on 'material' undisclosed information and have to report their holdings within the first ten days of the month following the month of the trade (Persons (1997)). Capital gains they make on short-term swings in prices (formally within six months) must be repaid to the company. Other insiders, such as shareholders holding more than 10 percent of any equity class, must also report their trades to the SEC. These transactions are published in the SEC's monthly *Official Summary of Insider Transactions*.[2] In general, the essence of US rules on insider trading is that insiders must either abstain from trading on undisclosed information or release this information to the public before they trade (Hu and Noe (1997)).

The UK approach is different. First, insiders are defined as members of the board of directors (covering executives and non-executives) whereas in the US insiders also include large shareholders. Second, UK regulation contained in the 1977 Model Code of the London Stock Exchange (LSE) and the 1985 Companies' Act is stricter than the US regulation (Hillier and Marshall (1998)). The directors of companies traded on the LSE cannot trade during the two months preceding a preliminary, final or interim earnings announcement and one month prior to a

[1] The term 'officer' covers the 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, or finance), and any other person who performs a policy-making function within the company (Bettis, Coles and Lemmon (2000)).

quarterly earnings announcement. In exceptional circumstances where it is the only reasonable course of action available to a director, clearance may be given to the director to sell (but not to purchase) when he would otherwise be prohibited from doing so. However, according to Hillier and Marshall (1998), insider trading is virtually non-existent for a two-month period prior to the final and interim announcements. Outside this period, directors still require clearance to trade from the board's chairman. In general, there are no such restrictions in the US system[3] which favours frequent disclosure to remove possible insider advantages rather than trading bans at price sensitive times.

Furthermore, the UK Model Code also prescribes fast reporting of directors' dealings. The directors must 'inform their company as soon as possible after the transaction and no later than the fifth business day' after a transaction for their personal account or on behalf of their spouses and children (Friederich et al. (2002)). In turn, a company must inform the LSE without delay and no later than the end of the business day following receipt of the information.[4] Via its Regulatory News Service, the LSE disseminates this information immediately to data vendors. The company is also required to enter this information into its Register, which is available for public inspection, within three days of reporting by the director.

Still, although UK regulation may be stricter than that in the US, what matters is its legal enforcement. Dedman (2004) states that 'researchers should beware assuming that UK directors and firms are subject to the same litigation threat as their US counterparts. One reason for this reduced risk has been that class actions have historically been difficult to launch in the UK, relative to the US. Following the reform of these procedures in 2000, there was speculation that the number of

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[2] Chang and Suk (1998) argue that investors can obtain information on an insider transaction already on the same day via the online news service of the SEC or via its reading room. Within 1-2 days, an announcement then appears in the Wall Street Journal or other financial press.

[3] Lustgarten and Mande (1995) show that the volume of US insider trading declines as an earnings announcement approaches but it does not decline to zero. It should be noted, however, that besides the federal regulation, a large fraction of US firms impose additional insider-trading restrictions on their directors and officers that in many cases also include trading bans (Bettis et al. (2000)).

class actions in the UK would drastically increase, but some argue that the UK procedure still makes it difficult for investors to sue. For instance, in the UK the loser pays the winner's costs, making it difficult for smaller investors to take action. This is not the case in the US, which reduces the risk of investors who have already lost money.' She also states that UK firms which commit market abuse may also be subject to administrative sanctions, e.g. by the LSE, though anecdotal evidence points to the leniency of the UK authorities. For example, even though the LSE ruled in June 1999 that British Biotech had misled investors and broken rules on directors' dealings, the firm was not fined and the directors received no other discipline than public censure by the LSE.

In 2000, the LSE transferred its authority to impose administrative penalties to the Financial Services Authority (FSA) and the FSA argues that the above criticism no longer applies.[5] The Financial Services and Markets Act (FSMA) 2000 (effective from 1 December 2001) clearly defines illegal insider trading[6] and specifies a dual prosecution track: lack of disclosure, violation of trading bans or misuse of inside information can be prosecuted under the Misuse of Information Act under civil law or under criminal law. Given that the new procedures have only recently been introduced and that investigations take a substantial amount of time, there has only been one conviction since 2001 (via a civil court procedure), namely that of the Company Secretary of Middlemiss who traded equity prior to earnings announcements.[7]

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[4] This implies that information about an insider transaction can reach the market as late as 6 days after the transaction. However, in practice, this information is disclosed faster: for more than 85 percent of the directors' dealings in our sample the announcement day coincides with the transaction day or takes place the following day.

[5] Based on interviews with several members of the FSA.

[6] 'Any person who does act or engages in any course of conduct which creates a false or misleading impression as to the market in or the price or value of any relevant investments is guilty of an offence if he does so for the purpose of creating that impression and of thereby inducing another person to acquire, dispose of, subscribe for or underwrite those investments or to refrain from doing so or to exercise, or refrain from exercising, any rights conferred by those investments' (FSMA 2000, s.397).

[7] About the current state of affairs, the FSA was only stating that 'several cases, a mixture of lack of disclosure, violation of trading ban periods and misuse of insider information, are currently being investigated and some of which will be brought to court via the civil or criminal procedure.' Violation of trading bans seems rare (which confirms Hillier and Marshall (2002)).

II. Literature review and hypotheses

The existing empirical literature uses two approaches to measure the effect of insider information on share prices. One strand of the literature argues that the price reaction to insider trading is gradual. This literature measures the price reaction via the cumulative abnormal returns earned over the 6 to 12 months after the transaction. The achievement of significant abnormal returns over this period is interpreted as proof of the existence of superior information (see, e.g., Jaffe (1974), Rozeff and Zaman (1988), Lin and Howe (1990), Gregory et al. (1997), and Lakonishok and Lee (2001)). The second strand of the literature assumes that stock markets are (to some degree) informationally efficient and that share prices adjust rapidly to insider trades. These studies measure the abnormal return on the date of announcement of the insider trade (Jaffe (1974), Chang and Suk (1998), and Friederich et al. (2002)).

We test the standard hypothesis whether directors trade on superior information (or at least, whether the market believes that the directors trade on superior information). By purchasing shares in their firm, directors send a positive signal about the future value of the firm to the market. The signal is costly as the directors put their own wealth at stake and bear the cost of holding less than optimally diversified investment portfolios. Therefore, directors' purchases are credible signals to outsiders.

Hypothesis 1a: The market reaction to the announcement of directors' purchases is positive.

Conversely, directors signal negative news when selling shares. Nevertheless, this signal may be less informative as liquidity needs – rather than changes in their expectations about the firm's future cash flows – may force directors to sell shares (Lakonishok and Lee (2001) and Friederich et al. (2002)).[8]

Hypothesis 1b: The market reaction to the announcement of directors' sales is negative.

[8] The directors selling shares in our sample not only own relatively large shareholdings in their firms (more than 0.1% of the market capitalization), but the company also provides most of their other sources of income (salary, bonus and possibly stock options).

Given the mixed reasons behind sales, we expect that the absolute value of the market reaction to sales is lower than that to purchases.

Hypothesis 1c: The absolute value of the market reaction to directors' sales is smaller than that to purchases.

Next, we relate the market announcement reaction to the type of director who is trading and to specific control characteristics. We first test the information hierarchy hypothesis, which postulates that the information content of the transactions depends on the type of director who trades (Seyhun (1986)). Second, we relate information asymmetry to control structures.

According to the information hierarchy hypothesis, directors who are familiar with the day-to-day operations of the company trade on more valuable information. Seyhun (1986) and Lin and Howe (1990) partially confirm this hypothesis on US data.[9] Seyhun shows that CAARs following the trade are significantly higher when a member of the board of directors trades. Lin and Howe (1990) demonstrate that trades by chairmen, directors, officer-directors, and officers contain more information than those by large shareholders. In contrast, Jeng, Metrick and Zeckhauser (1999) question whether insiders can profit from their information advantage. "Some insiders are more 'inside' than others. The chief executive, for example, is likely to have better information about the firm's prospects than do lesser officers. Of course, since the CEO's trades are likely to be carefully scrutinized, both by shareholders and by regulators, they may be more reluctant to trade on his informational advantage. The net effect of these considerations on the profitability of insider trading is an empirical question." They conclude that insiders profit 'handsomely' from their informational advantage (especially from their purchases) However, they do not find any support for the information hierarchy: CEOs realize lower abnormal returns (though not significantly lower)

[9] Seyhun (1986) measures the market reaction to insider trades by the CARs covering the first 50 and 100 days, respectively, following the day of the trade. Lin and Howe (1990) use six- and twelve-month CARs.

than those earned by other officers and directors.[10] They come up with two possible explanations. First, as top executives are more carefully scrutinised by market participants and regulators, they may be more reluctant to trade on an informational advantage. Second, trades by top executives are on average twice as large as those by other officers or directors and larger transactions trigger stronger price reactions. Thus, the early results of Seyhun (1986) and Lin and Howe (1990) may have been driven by transaction size.[11]

Purchases by former directors may trigger stronger abnormal announcement returns than purchases by incumbent directors, as former directors still possess superior information and can trade more freely on that information.[12] In turn, when former directors sell shares, the market may not react if it believes they sell to diversify their portfolio and not because of negative insider information.

Hypothesis 2: *The abnormal returns associated with purchases and sales depend on the type of director. The positive (negative) abnormal returns following purchases (sales) decrease in absolute value with the category of director in the following order: chief executive officer, other executive directors, non-executive chairman, non-executive directors.*

Hypothesis 3: *Purchases by former directors cause strong positive announcement returns, whereas their sales do not trigger a market response.*

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[10] The results of Seyhun (1986) and Lin and Howe (1990) are not directly comparable to those of Jeng et al. (1999) given the different methodologies of calculating the returns.

[11] We are not aware of any UK evidence on the subject.

[12] The Hemmington Scott database contains the trades of the former directors until 2 months subsequent to the financial year during which they left the firm. Given that this database does not contain the director turnover dates, we try to provide an estimate for how many months the trades of former director are traced using the director departure data of Franks et al. (2001). The vast majority of natural turnover is related to retirement (with a few cases of departure due to illness or death); and the retiring directors mostly stay until the end of the fiscal year. Hence, the average retirement date for this type of turnover is the final month of the financial year. This means that, for about 70% of departing directors, the trades are traced for only 2 months subsequent to their departure. For 'conflictual' turnover, the average retirement date lies near the end of month 9. Of this category, around a third (10% of the total) depart in the final month of the financial year as this category of turnover also includes the departure of directors reaching the end of their (non-renewed) contract. Only slightly less than one fifth of directors are departing at various times throughout the year. To conclude, the transactions of 80% (88%) of all former directors are followed for 2 (3) months. The transactions of only a small minority of former directors are traced over longer time windows. Therefore, it may not seem implausible that former directors are still considered as 'insiders'.

Agency theory predicts that large blockholders reduce agency and information problems provided they are good monitors (Maug (1998), Admati, Pfleiderer and Zechner (1994)). Hence, dealings by directors contain less information under concentrated outside ownership. When outsiders monitor the firm, directors enjoy fewer private benefits of control and are more likely to maximize shareholder value. As intensive monitoring may lead to better managed firms, market participants derive less information from directors' transactions. Thus, the announcement effect of directors' dealings is smaller in the presence of outside blockholders.

Holderness and Sheehan (1988) show that the ability and incentives of a controlling shareholder to monitor the management depend on his category. Most empirical studies distinguish between three categories: corporations, institutional investors, and individuals or families not related to the management. UK institutional investors, such as banks, investment and pension funds, and insurance companies, are not deemed to monitor the companies they invest in (Franks et al. (2001)). They do not usually have the resources to monitor the (many) firms they invest in. In addition, monitoring would provide them with inside information and their investments would therefore be locked in (Goergen and Renneboog (2001)). Thus, only outsiders such as corporations, and individuals or families unrelated to the management, monitor the firms they invest in.

Hypothesis 4: *The announcement effect of directors' purchases and sales is weakened by the presence of a monitoring outside blockholder (corporations and individuals or families unrelated to the directors).*

The fact that institutional investors do not monitor gives them the opportunity to trade on publicly available signals. Thus, they may merely follow directors' dealings and their trades may strengthen the positive signal of directors' purchases.

Hypothesis 5: *The announcement effect of directors' purchases and sales is stronger in the presence of an institutional blockholder.*

Directors do not only have direct access to restricted information but also have different incentives from outside blockholders (Holderness and Sheehan (1988)). For directors, the performance of their shares may be of secondary importance if they derive private benefits of control from their position. These private benefits are not transferable but are investor-specific: they may be a salary, perquisites, prestige or reputation, or value expropriated from shareholders (Johnson, La Porta, Lopez-de-Silanes and Shleifer (2000), Dyck and Zingales (2003)). At low levels, director ownership is believed to align the incentives of the directors with those of the shareholders (Jensen and Meckling (1976)). However, at higher levels of ownership, directors may become entrenched and may insulate themselves from any disciplinary action in the case of poor performance (Morck, Shleifer and Vishny (1988), Franks et al. (2001)). Consequently, the market may react negatively to the announcement of a director's purchase if it substantially increases his stake. The negative effect of increased entrenchment may even dominate the otherwise positive.[13] Similarly, the market may react positively to a director's sale if it considers that the benefits from reduced managerial discretion outweigh the negative signal.

Hypothesis 6a: In firms with strong control by the directors, the positive (negative) announcement effect of directors' purchases (sales) is weaker because the purchases (sales) increase (decrease) directors' entrenchment.

The information effect of directors' purchases and sales should also depend on the distribution of voting power within the firm. A high concentration of director ownership may create less of an entrenchment problem provided it faces strong outsiders. Strong outsiders may prevent directors from making decisions that do not maximise firm value. Therefore, the entrenchment effect

[13] The entrenchment effect refers to the fact that directors with substantial voting power may become unaccountable and/or exploit their private benefits at the expense of other shareholders. There is evidence that entrenchment frequently occurs in the UK. Lai and Sudarsanam (1997) and Franks, Mayer and Renneboog (2001), Faccio and Lasfer (2000) show that directors with substantial voting power cannot be ousted even in the wake of poor performance. Furthermore, the appointment of outside directors depends on entrenchment (Peasnell, Pope and Young (2003)). There is also evidence that the benchmarks used in managerial remuneration contracts are determined by the degree of managerial control (Renneboog and Trojanowski (2003)). The remuneration of executive directors in firms with strong outside shareholders depends on share price performance whereas it depends on accounting benchmarks in firms where managers have more discretion.

formulated in Hypothesis 6a may be weaker for firms whose directors' voting power is balanced by the presence of strong outsiders.

Hypothesis 6b: When directors own large stakes in the presence of blocks held by corporations and individuals or families unrelated to the directors, the market is less concerned about entrenchment. This leads to a stronger positive signal of purchases and a stronger negative signal of sale.

If a firm is performing poorly or is financially distressed, we expect a stronger market reaction to directors' transactions. Given the more substantial cost of a wrong signal, the signal is more credible. Hence, if directors buy more shares in a loss-making firm, then the market reaction should be significantly more positive. If directors of poorly performing or financially distressed firms sell shares, this may reflect their pessimistic expectations. The CAARs associated with the announcement of such transactions are expected to be strongly negative irrespective of the ownership structure.

Hypothesis 7: For poorly performing companies, directors' purchases and sales trigger stronger announcement reactions.

Furthermore, Franks et al. (2001) show that the degree of monitoring by blockholders depends largely on corporate performance. They document that blockholders discipline the management in periods of poor performance and/or financial distress. Similarly, Franks and Nyborg (1996) show that the presence of outside blockholders increases the likelihood of corporate restructuring. Furthermore, when directors increase their share stake in a poorly performing firm in which they already own a substantial shareholding, they put more of their own wealth at risk such that the market may react more positively to this signal. This positive signal of additional personal investment in poorly performing firms may outweigh the negative effect arising from the danger of increased entrenchment. Consequently, directors' purchases in poorly performing companies cause

stronger positive price reactions when (i) there are active outside blockholders (such as corporations, and individuals or families) **and** (ii) directors already own a substantial stake.

*Hypothesis 8: Directors' purchases in poorly performing companies with outside blockholders **or** strong director ownership trigger stronger positive price reactions.*

III. Data sources, descriptive statistics and methodology

A. Data sources

Our data cover directors' dealings, ownership, daily returns, and company specific information such as capital structure changes, number of shares outstanding, industry, accounting data and news.

Directors' dealings data are for the period of 1991 to 1998 and were obtained from Hemmington Scott. The original file contains 58,363 entries and includes information on company name, director's name, director's holdings, director's position on the board, transaction and announcement date, number of shares traded, price, security type (90 different types),[14] and transaction type (12 different types).[15] The exclusion of directors' trades in financial firms, duplicate entries and some inaccurate or incomplete reporting of transactions reduces the number of observations by roughly 40 percent.[16] We aggregate multiple purchases (or sales) by the same director on a given day (e.g. one sale of 10,000 shares and another one of 5,000 shares make one sale of 15,000 shares). Furthermore, when a director purchases and sells shares on the same day, we net the transactions (e.g. a purchase of 10,000 shares and a sale of 5,000 shares becomes a net purchase of 5,000

[14] The 90 security types include, for example, ordinary shares, restricted voting shares, options, warrants, convertibles. The full list of security types is available upon request.
[15] Transaction types are buy, sell, exercise, options granted, sale post exercise, take up, scrip dividend, inherited, bed & breakfast, gift given, gift recorded, and scrip issue.
[16] The main reason for the reduction in observations is the deletion of duplicate information resulting from the fact that directors' transactions were collected from various sources (Regulatory News Service, Reuters, Thomson Financial, and LexisNexis). The number of errors refers to entries for which there is no code indicating whether the transaction is a sale, sale post exercise etc. or to typos in codes. The number of such omissions is very limited: only 253 out of over 58,363 entries).

shares). Following all these adjustments, the sample covers 35,439 directors' transactions for 1,498 firms.

The most frequent transactions are on ordinary shares and the exercise of options: 27,416 trades (78 percent of all insider transactions) and 5,885 transactions (17 percent), respectively. As very small transactions are likely to be ignored by the market, we only retain the (net) transactions involving at least 0.1 percent of the shares outstanding. Furthermore, as sales after the exercise of options are likely to be related to the remuneration package of directors, their information content is expected to be low. Hence we exclude these sales. These rules eliminate 83 percent of all purchases on ordinary shares (12,019 out of 14,500) and 61 percent of all sales (4,101 out of a total of 6,769 transactions). We analyse the transactions with respect to their relative rather than absolute value because the paper focuses on relative voting power and changes in control.[17]

Changes in company names are traced with the help of the London Share Price Database (LSPD) which also provides information on the SEDOL number, birth and death dates, and the reason for birth and death. The number of shares outstanding for each firm-year and the industry code are also collected from the LSPD and matched with the directors' dealings file. The number of shares outstanding is used to calculate the relative size of the transaction.

Ownership data is obtained from Worldscope which records all direct ownership stakes of 5 percent or more of ordinary shares outstanding. We classify these stakes according to their owner: directors (insiders), corporations, institutional investors, and individuals or families not related to the directors. We use the Stock Exchange Yearbooks to check whether the individuals reported in the

[17] A threshold based on relative size has the disadvantage that the value of the threshold (0.1 percent of market capitalization) varies from company to company. In value terms, our threshold of 0.1% amounts to GBP 14,616 (GBP 63,626) for the median (average) purchase transaction, while it amounts to GBP 31,908 (GBP 107,433) for the median (average) sales transaction. Still, another threshold based on absolute transaction value (e.g. GBP 25,000) is also arbitrary and, moreover, the absolute size of the transaction is more likely to be dependent on the director's wealth rather than on company-specific characteristics. The absolute size of the transaction would necessarily have to be standardized by some benchmark of the director's wealth (e.g. by the value of his remuneration package). Yet another alternative threshold could be based on the transaction size expressed as a percentage of the director's existing ownership stake. However, the signal emitted by the director's transaction depends on how the relative transaction size relates to the distribution of voting power of the outside blockholders which would not be captured by this threshold.

database (around 7,400 persons) are: (i) the CEO, (ii) the executive chairman, (iii) the joint CEO-chairman (if applicable), (iv) another executive director, (v) a non-executive chairman, (vi) another non-executive director, and (vii) an individual who is neither a director nor related to a director.

Adjusted daily prices, dividends, data on the FTSE All Share Index, market capitalization, earnings after tax, return on equity, book-to-market ratio, debt-equity ratio and interest coverage are obtained from Datastream.

B. Descriptive statistics

Table I reports the summary statistics. Panel A provides the statistics for all the trades. The statistics in Panel A are directly comparable to those of Lakonishok and Lee (2001) for the US. Panel B shows the statistics on the transaction sizes of net purchases and net sales, respectively, which represent at least 0.1 percent of the market capitalization of a firm. Panel C records accounting characteristics whereas Panel D shows the ownership structure of the firms. According to Panel A, directors of UK firms trade less frequently than their US counterparts. Even though the fraction of firms with at least one transaction per year is almost the same, there are, on average, each year only 1.49 (1.09) purchases (sales) per UK firm compared to 2.77 (4.74) purchases (sales) per US firm. The transaction size as a percentage of the market capitalization is also smaller: 0.2 percent (0.5 percent) for a purchase (sale) versus 0.6 percent (1.3 percent) for the US.[18] We believe that the lower trading activity of UK directors compared to US directors is due to the stricter regulation in the UK. Furthermore, the higher frequency of directors' sales for the US could be due to the fact that American directors are awarded more stock options than their British counterparts (Conyon and Murphy (2000)).

[Insert Table I about here.]

[18] Trading, measured as the total number of shares traded per firm-year (not shown in the table), increased throughout the beginning of the period, peaked in 1996, and decreased thereafter. During the sample period, UK directors sold only two to three times as many shares as they bought compared to seven times for US directors.

Panel B shows that, on average, directors' purchases are smaller than sales. The median net purchase is £36,000 compared to £147,155 for the median net sale. The median net purchase (sale) as a proportion of market capitalization is 0.27 percent (0.48 percent). CEOs and chairmen are the most active traders accounting for 581 and 492 (490 and 350) purchases (sales), respectively. Both the purchases and sales of former directors are surprisingly similar – both in number and relative size – to those of the incumbent directors.

Panel C shows that directors sell more shares than they purchase in larger firms, more profitable firms, and those with less debt and lower book-to-market ratios. According to Friederich et al. (2002), directors purchase stock when they believe it is undervalued (as measured by a high book-to-market ratio).

Panel D of Table I shows the ownership structure – measured at the beginning of the year of the transaction – for firms with net purchases and those with net sales, respectively. Sixty-nine percent of the firms with net purchases and 66 percent for the firms with net sales have a blockholder, i.e. a shareholder owning more than 5% of the equity. On average, the blockholders hold jointly 28 percent in firms whose directors purchase shares versus 22 percent in firms whose directors sell. Institutional investors are blockholders in the majority of firms (in 60 and 56 percent of firms with net purchases and net sales, respectively) but their blockholdings are more modest as they hold 23 percent (18 percent) on average in firms with net purchases (net sales). Directors are the largest shareholders. They own on average around 25 (23) percent of firms with net directors' purchases (net sales). Individuals or families unrelated to the management control only around 9 and 10 percent for firms with net purchases and sales, respectively, compared to 15 and 14 percent, respectively, for corporations.

C. Methodology

We compute the abnormal returns (AR) by using the market model for a period of 41 days centred on the announcement day. The market return is proxied by the FTSE All Share index excluding investment trusts and the beta is estimated over a period of 200 to 21 days before the event day. To check the robustness of the results, we also calculate market-adjusted returns. Several studies (e.g. Rozeff and Zaman (1988) for the US, and Gregory et al. (1994) for the UK) highlight the importance of controlling for size when calculating abnormal returns over a long post-event window, or when the sample includes a large number of smaller companies. Rozeff and Zaman (1988) argue that abnormal returns are higher for smaller companies. If directors' purchases are concentrated in smaller firms, and if their shares tend to earn positive abnormal returns, then the abnormal returns on their trades may be partly attributable to the size effect. We use the same size-adjustment method as in Lakonishok, Shleifer and Vishny (1994) and form ten size portfolios based on market capitalization at the beginning of the calendar year and calculate the equally-weighted average return for each portfolio. Each return $R_{i,t}$ is adjusted by return $R_{p(i),t}$ earned on the size portfolio p which security i belongs to.[19]

Test statistics

To test the null hypothesis that the cumulative average abnormal returns are equal to zero for a sample of N securities, we use three parametric test statistics:

$$t_{CAAR} = \frac{\frac{1}{N}\sum_{i=1}^{N} CAR_i}{s(CAR)/\sqrt{N}}, \qquad J_1 = \frac{CAAR}{s(CAAR)}, \text{ and} \qquad J_2 = \sqrt{\frac{N(L_i - 4)}{L_i - 2}}\,\frac{1}{N}\sum_{i=1}^{N}\frac{CAR_i}{s(CAR_i)}$$

[19] An alternative would be the Dimson and Marsh (1986) model that uses betas obtained from size portfolios. However, Gregory et al. (1997) report that the difference between the Dimson-Marsh benchmark and the Lakonishok et al. (1994) benchmark is relatively small for UK data.

where CAR_i is the cumulative abnormal return for security *i,* and *CAAR* is the cumulative average abnormal return; where $s(CAR_i)$ is the sample standard deviation of the individual cumulative abnormal returns:

$$s(CAR_i) = \sqrt{\sum_{t=t_1}^{t_2} s_i^2} \text{ with } s_i = \sqrt{\frac{1}{L_i - 2} \sum_{t=T_{0i}}^{T_{1i}} \left(R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t}\right)^2};$$

where s(CAAR) is the standard deviation of the cumulative averaged abnormal returns $s(CAAR) = \sqrt{\frac{1}{N^2} \sum_{i=1}^{N} \sum_{t=t_1}^{t_2} s_i^2}$ with s_i being an estimator for the standard error of abnormal returns for security *i*.

The t_{CAAR} is the test statistic as in Barber and Lyon (1997). It is Student-t distributed with *N*-1 degrees of freedom and approaches the normal distribution as *N* increases. J_1, and J_2 are based on Campbell, Lo and McKinley (1997). The choice between these two statistics depends on the hypotheses regarding the variance of the abnormal returns. If the abnormal return is larger for securities with higher variance, J_1 is preferable as it gives equal weight to the realized cumulative abnormal return of each security. If the true abnormal return is constant across securities, J_2 is preferable as it gives more weight to the securities with the lower abnormal return variance (Campbell et al. 1997:162). For most studies, Campbell et al. argue, the results are expected not to be sensitive to the choice of the above test-statistics because the variance of the CAR is usually of a similar magnitude across securities.

The above test statistics are based on the assumption that returns are jointly normally, independently, and identically distributed. Below, we discuss the following robustness checks: (i) non-normality of abnormal returns, (ii) non-synchronous trading, and (iii) event clustering. To check the robustness of our results with respect to non-normality, we use the non-parametric t_{rank} test – Corrado's (1989) non-parametric rank statistic. This non-parametric rank statistic does not require abnormal returns to be normally distributed. Moreover, Campbell and Wasley (1993)

document that, compared to the (parametric) standardized test statistic and to the (parametric) portfolio test statistic, this rank statistic is consistently the best specified and most powerful test statistic across numerous event conditions. It is robust to multi-day event periods, clustered event dates, and increases in variance on the event day.

The non-trading (or non-synchronous trading) effect arises when prices are assumed to be recorded at time intervals of one length when in fact they are recorded at time intervals of other, possibly irregular lengths (MacKinlay (1997)). This can lead to biased betas in the market model. Scholes and Williams (1977) and Dimson (1979) present a consistent estimator of beta in the presence of non-trading that adjusts the beta estimates upwards. This results in smaller abnormal returns for thinly traded securities. However, Jain (1986) shows that, in general, the adjustment for thin trading is not substantial. Campbell and Wasley (1993) also conclude that adjustment according to Scholes and Williams (1977) does not improve the Type I error or the power of parametric test statistics. Furthermore, they show that the rank statistic using the abnormal returns obtained from the market model performs best. Therefore, we also rely on the rank test for the robustness checks of the test-statistics of firms suffering from thin trading.

The above expressions for the standard-deviation of the cumulative abnormal returns assume that the event windows of individual securities do not overlap.[20] This assumption of absence of clustering allows us to calculate the variance of the sample's cumulative abnormal returns without concern about the covariances across securities as they are zero (MacKinlay (1997)). If this assumption is incorrect, then the parametric tests may be biased. Still, Brown and Warner (1985) conclude that, in general, the use of daily or weekly data makes clustering of events on a single day much less severe than the use of monthly data. Also, diversification across industries further mitigates the problem (Bernard (1987)). The rank statistic takes care of the event clustering problem as it takes cross-sectional dependence into account via the aggregation of the abnormal

[20] Event clustering is not a serious problem in this study as the average number of events (insider transactions) per firm over the 8-year period 1991-1998 is 2.86 (purchases) and 2.77 (sales) with medians of 2 for both.

returns on an individual security into time series of portfolio mean ranks. Campbell and Wasley (1997) show that the rank test is again well-specified, also for multi-day event periods. Therefore, the rank test is a good robustness check in case of event clustering.[21]

IV. Results

This section presents the empirical results of the study. First, we report the event study results capturing the market reaction to directors' purchases and sales. Second, we test the information hierarchy hypothesis on the market reaction across different categories of directors. Third, we outline what impact the presence of different types of blockholders has on the information content of directors' transactions. Fourth, we investigate the value of the signal emitted by directors' trades under poor performance and financial distress.

A. Market reaction to directors' trades

The results reported in Table II and Figure 1 strongly support Hypothesis 1a, namely that there is a strong positive market reaction to directors' purchases. This implies that these transactions bear a high informational content. The two-day CAARs based on the announcement day and the following day from the market model (3.1%), as well as those from the market-adjusted model (2.9%) and size-adjusted model (2.9%) are all significantly different from zero whatever the test statistic used (Panel A of Table II).[22]

[21] Furthermore, for hypothesis tests over intervals of more than one day, the autocorrelation of the abnormal returns should be taken into consideration. Failure to do so may result in misspecification of the estimated variance of the cumulative average abnormal returns. However, Brown and Warner (1985) show that, even though autocorrelation is present, the benefits from autocorrelation adjustments appear to be limited. Campbell and Wasley (1993) draw a similar conclusion: they show that test statistic specifications are not significantly affected by serial dependence. A shift in the variance and the mean of the returns on the event day resulting from the release of new information may cause another type of misspecification, namely, event-induced variance. Still, Campbell and Wasley (1993) show that the rank test is not liable to such misspecification.

[22] The results indicate that the market reacts to the directors' purchases not only at announcement but also over the 2 days prior to the transaction date (Figure 1). This seems to suggest that the market reacts to some of the directors' purchases on the transaction date. This may have two causes: first, it may be that traders observing a large purchase order (without knowing the identity of the purchasing party) follow that purchase order believing the purchasing party has superior information. Second, it may be that the fact that a director intends to trade is known to his direct environment (the board of directors which should formally allow the directors' transaction prior to the trade, his family or friends). Such trading on non-public information is illegal.

For the purchases, the positive average abnormal returns are persistent over the whole 20-day period following the transaction (see Figure 1) and the CAAR amounts to 8.47 percent including the announcement reaction. Table II shows that the CAAR is significantly negative (–1.27 percent) over the twenty days prior to the purchase transaction. This suggests that directors time their purchases.

[Insert Table II and Figure 1 about here.]

Panel B of Table II shows that the market reacts negatively to announcements of large sales. The CAAR measured over the announcement day and the following day is –0.37 percent and is significantly different from zero.[23] The CAAR decreases to –1.92 percent over the following 19 trading days. This follows a period of positive abnormal returns of about 3 percent over the twenty days preceding the announcement. Figure 2 depicts the development of the CAAR over the 41-day window centered on the announcement day. As with purchases, directors seem to time their sale transactions.[24] We conclude that directors' sales are also information-revealing events, but are interpreted as negative news. Hence, we fail to reject Hypothesis 1b.

[Insert Figure 2 about here.]

The abnormal returns in Panels A and B of table II refer to large transactions only. In order only to improve the omparability with most US studies which look at all transactions irrespective of size, Panel C and Panel D show the CAARs for all the trades and the small transactions only, respectively. [25] The announcement effect for all the purchases is only about one third of that for the

[23] The CAARs based on the market-adjusted and size-adjusted models are smaller at –0.21 percent and –0.24 percent, respectively, but are still strongly statistically significant.

[24] The market reaction based on the transaction date is less robust in terms of statistical significance. The non-parametric rank tests show strong statistical significance whereas most parametric tests do not, presumably as the distributional assumptions of these tests are not valid. In contrast to our results from directors' purchases, this suggests that the market does not observe the transaction itself but reacts to the trade at the announcement of the transaction. This difference cannot be explained by differences in the distribution of transaction dates relative to announcement dates.

[25] Even when using the same transaction-size benchmark, there is a second reason which makes a direct comparison of our findings with those for the US difficult. US insiders are managers as well as large shareholders owning more than 10 percent of the equity (excluding commercial banks, brokers, insurance companies, investment banks, investment advisers, employee benefit plans, pension funds and mutual funds, regardless of the size of their holdings). Some US

large purchases. The CAARs for all sales are 30 percent smaller than those for the large sales. Comparing the UK results of Panel B with the US results of Lakonishok and Lee (L&L hereafter) (2001; table III), the UK abnormal returns are in absolute terms three times as high as the US ones: over the 5-day window the UK CAAR for purchases (sales) is 1.75 percent (–0.56%) compared to a US CAAR of 0.59 percent (0.13%).[26] For a sample of 196 mid-cap UK firms (1986-94) Friederich et al. (2002) also find a positive (negative) market reaction to directors' purchases (sales): the CAAR(0,1) amounts to 0.42 percent (-0.17%). The announcement effects of small trades in our sample (panel C) are even smaller: 0.70 percent for purchases and 0.25 percent for sales.

Our results confirm Hypothesis 1c that the absolute market reaction to directors' purchases is higher than that to sales. This difference is in line with Jeng et al. (1999) and Lakonishok and Lee (2001) for US firms and Friederich et al. (2002) for UK firms. For instance, L&L (2001) report that insider purchases trigger 4 times stronger abnormal returns than sales. Similarly, for the longer run, Jeng et al. (1999) show that purchases yield significantly higher returns. The reason for this pattern may be that markets may attach less informational content to sales as part of the sales may be caused by the directors' liquidity needs. Another reason may be related to the entrenchment effect. Whereas there is a significantly negative price reaction to the vast majority of sales transactions, there is no significant reaction to the sale of 'very large' equity stakes (5% or more). The absence of a price reaction to large sales may be due to the reduction in managerial entrenchment (and the potential expropriation of outside shareholders' value). We further examine this reason in the regression models (see below).

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papers only show aggregate insider results. Even though some US studies exclude large shareholders as insiders, the results from these studies still cannot be compared directly to those for the UK. Whereas in the UK insiders are directors, US insiders include officers (the 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, or finance), directors, other persons who perform a policy-making function within the company (Bettis et al. (2000)) as well as other key employees. Thus, given the more wide-ranging definition of insiders in the US, which includes managers at lowers levels, we expect that US insider trades are less informative and hence trigger smaller price reactions. Second, to the opposite of Lakonishok and Lee (2001), we exclude sales following the exercise of options by the directors. Such sales presumably reveal less information as the market may expect that the directors sell the shares underlying the option schemes to release that part of their remuneration (Friederich et al. (2002), Jeng et al. (1999), and Lustgarden and Mande (1995)).

[26] L&L do not report the statistical significance of their findings (but mention in a footnote that 'most abnormal returns are significantly different from zero'. Still, they consider that their results are not 'economically significant'.

Throughout the paper we focus on cumulative abnormal returns measured around the announcement date. We focus on the announcement date rather than the transaction date, because a director's identity is only disclosed when this information is released via the RNS (and not when the order is placed). Still, the placing of an order itself may create a price effect. Therefore, we also calculate the abnormal returns for the trades whose transaction date and announcement date coincide (36% of the purchases and 41% of the sales) and for those trades whose transaction date precedes the announcement date.[27] For the purchases where the announcement and transaction dates coincide, the CAAR (0,1) is 3.9% as compared to only 2.7% for the purchases where the two dates differ and the difference is significantly different from zero. This suggests that there is a modest micro-structure effect (provided that there is no illegal insider trading by directors' relatives or front-running). In contrast, for the sales the difference is not statistically significant (–0.27% for the sales where the two dates coincide versus –0.42% for the other sales).

B. Test of the information hierarchy hypothesis

Hypothesis 2, the information hierarchy hypothesis, postulates that those directors who are more familiar with the day-to-day operations of the company trade on more valuable information. Our dataset distinguishes between five categories of directors: CEOs (including joint CEO-chairmen), other executive directors (the deputy CEO and the financial officer), chairmen (non-executives in more than 90 percent of the cases), other incumbent directors (both executive and non-executive directors not included in the previous categories), and former directors. The categories are listed in decreasing order of the superior information they are supposed to possess. The category of 'other incumbent directors' includes both executive and non-executive directors, as the database does not distinguish between the two. Still, as the three most senior executive directors are already included in the first two categories and there are usually on average three executive directors on the board,

[27] In more than 85% of the transactions, the announcement day coincides or immediately follows the transaction date.

the vast majority of directors in this category are non-executives. Former directors are those directors who resigned or were dismissed within the financial year preceding the transaction.

We test the information hierarchy hypothesis in two ways. First, we compare average abnormal returns earned after trades by each of the individual categories of directors. Second, we perform a regression analysis with the two-day CAR as the dependent variable and dummy variables representing the individual categories as explanatory variables. The regression analysis allows us to control for other factors such as the transaction size, firm size, industry affiliation, and simultaneous trading by several directors.

Panel A of Table III reports the results of the event studies for purchases made by the different categories of directors. The J-form pattern of the abnormal returns around purchases that was observed for the whole sample (Figure 1) also applies to the purchases made by all the individual categories of directors. For all the categories of directors, the CAARs are significantly negative over the twenty days prior to the announcement, but become increasingly positive after the announcement day. In general, the CAARs covering the announcement day and the next day range from 2.4 percent to 3.8 percent, and are strongly significant. Still, these results do not support Hypothesis 2 on the information hierarchy as the differences between the (two-day) CAARs by category of director are not statistically significant (the t-statistics are not reported in the table), apart from the differences between the CAARs of CEOs on one side, and other incumbent directors and former directors on the other side. Surprisingly, the market reaction is weakest when CEOs purchase shares in their own company and is strongest after purchase transactions of former directors.

[Insert Table III about here.]

Panel B of Table III summarizes the regression results for directors' purchases. The dependent variable is the CAR covering the announcement day and the following day using the market model as a benchmark. In order to construct mutually exclusive director categories, we employ the

following algorithm. The dummy 'other top executives' is set to one if the deputy CEO or the financial director buys shares, but the CEO does not purchase any shares. The dummies for chairman, other incumbent directors, and former directors, are defined in a similar way. Hence, the constant picks up the effect of the CEO purchasing shares. The coefficients for the other dummy variables then pick up any differential market reaction as compared to the CEO-buying effect. If the coefficients are negative, then the information hierarchy is upheld as the market reaction to the CEO buying shares is highest. If the coefficients are positive, then the market reaction to other types of directors buying is higher than that to the CEO buying. We control for the (relative) transaction size and firm size (market capitalization at the beginning of the year). We also adjust for the possibility of multiple trades, as the fact that, on some days, more than one director of the same company buys shares may strengthen the signal.[28] We use two different types of dummies to adjust for multiple trading. The first one is 'multiple purchases', which is set to one, if more than one director purchases (with a minimum transaction value of 0.1 percent of the firm's market capitalization) and set to zero otherwise. For example, if both the CEO and a former director buy shares on the same day, then the CEO dummy is set to one (as a CEO is higher up the information hierarchy than a former director) and the 'multiple purchases' dummy is set to one. The second type of dummies is interactive dummies. Using the above example, the CEO dummy is set to one as well as the interactive dummy, 'CEO – multiple purchases'.

Model 1 in Panel B of Table III shows that the coefficients for all the categories of directors are positive and only one (for the chairman) is not statistically significant. The information effect of the CEO purchase (measured by the constant which is positive and significantly different from zero) is therefore lowest across all the directors' categories. For example, if a top executive other than the CEO buys shares, the market reaction is 4.9 percent (2.5+2.4) compared to only 2.5 percent if the

[28] For 96 percent of all the events, all transactions on a firm's shares during the same day are either all purchases or all sales. Hence, for only 4 percent of all observations, there are simultaneous purchases and sales in the same firm's shares. In these cases, an event is considered to be a purchase if the size (measured as a proportion of the firm's market capitalization) of the purchase(s) exceeds the size of the sale(s) by at least 0.1 percent. If this condition is satisfied and there is more than one (net) purchase exceeding 0.1 percent of the firm's market capitalization, the 'multiple purchases' dummy is set to one.

CEO buys. This contradicts Hypothesis 2 on the information hierarchy. Jeng et al. (1999) also find no support for the information hierarchy. They advance a possible explanation: the fact that the market follows CEO transactions more closely, may cause CEOs to trade more cautiously and at less informative moments. Second, top executives are often given company stock to improve their incentives to pursue the maximization of shareholder value. Third, the positive news associated with purchases of shares may be toned down by the negative news that the CEO strengthens his control over the firm to a level that causes entrenchment. The 'multiple purchases' dummy variable in Model 1 picks up the effect of several directors purchasing shares on the same day. The positive and significant coefficient documents that this constitutes a stronger signal for the market.

Model 2 in Panel B shows a similar result: multiple purchases make the positive market reaction even stronger. The model includes interaction terms between director-category dummy variables and the dummy for multiple purchases. So, for example, the first interaction term 'CEO – multiple purchases' indicates that, when both the CEO and another incumbent or former director purchase shares on the same day, the CAR is on average double that when only the CEO buys shares. Note that the coefficients on the other interaction terms are not significantly different from zero (these coefficients refer to cases when more than two directors of the other categories purchase shares but the CEO does not). Hence, the results suggest that CEO purchases that are accompanied by purchases by other directors have higher information content than purchases by the CEO alone.

Table IV is on the market reaction to sales by the different categories of directors. Panel A reports the market reaction measured by the CAARs. The CAARs are negative for all the directors' categories and are significantly different from zero, except for former directors (for the windows of two, four and six days starting with the announcement day). This evidence confirms Hypothesis 3 that there is no significant market reaction to former directors' sales as their sales are likely to be caused by portfolio diversification needs. Similar to purchases, the market reaction to sales by

CEOs tends to be lower than that to sales by other directors. Still, the differences are not significant which implies that Hypothesis 2 is not supported.

[Insert Table IV about here.]

Panel B shows the regression results for the sales. Model 3 is similar to Model 1 for purchases (Panel B of Table III).[29] The regression has very low explanatory power and none of the coefficients on the types of directors is significantly different from zero. The only coefficient which is significantly different from zero is that on multiple sales. This suggests that the market interprets directors' sales as negative news if several directors sell simultaneously. Conversely, if only one director sells, the market treats this as a sale done for liquidity needs rather than bad news. Similarly to the regressions for purchases, the regression for sales does not uphold Hypothesis 2 on the information hierarchy.

C. Test of the effect of corporate control

In what follows we test the impact of ownership concentration on the information content of directors' trades (Hypotheses 4 to 8). The two-day cumulative abnormal returns (CARs) are regressed on a set of ownership variables that measure the possible information content of directors' transactions in firms with different categories of blockholders: corporations, individuals or families unrelated to the directors, institutional investors, and directors. A specific ownership concentration dummy is set to one if there is a shareholder of that category owning at least 5 percent of the equity (this is our definition of a blockholder).[30] We also control for other determinants that may influence the information content of directors' transactions, i.e. simultaneous trading by several directors, transaction value, firm size, book-to-market ratio profitability, and leverage.

[29] We do not report the equivalent of Model 2 for sales as the model is not significant.
[30] Dispersed ownership is the reference category.

Table V contains the regressions results for directors' purchases whereas Table VI contains the results for sales.[31] The results in Panel A of Table V for directors' purchases provide strong support for Hypothesis 4. The coefficients measuring the information effect of blockholders who are expected to monitor the management – corporations, and individuals or families – are both negative. However, only the coefficient on corporations is significantly different from zero (at the 1 percent level of significance). This suggests that the positive information content of directors' purchases is mitigated by the presence of those outside monitors. Our results confirm that directors' purchases convey less new information when other corporations own a considerable stake in the firm.

[Insert Table V about here.]

Hypothesis 5 postulates that the market reacts stronger to directors' purchases in the presence of institutional blockholders. Our findings are consistent with Hypothesis 5. The coefficient on the institutional investor dummy variable is positive and highly significant (at the 1 percent level). This implies that the market reaction is more positive for firms with institutional ownership and reflects that institutional owners do not act as monitors and hence do not lower informational asymmetry. On the contrary, our result suggests that they seem to follow insider purchases in order to rebalance their portfolios.

Hypothesis 6a postulates that the positive informational effect of directors' purchases is weakened by the danger of (more) director entrenchment. Panel A of Table V supports the hypothesis. The coefficient on directors' block ownership is negative and statistically significant. In the presence of large directors' ownership, directors' purchases convey two important counter-acting signals: (i) the positive news about the firm's prospects and (ii) the negative news associated with increased insider entrenchment. Our results suggest that the latter effect is quite strong (within the 1% level of

[31] There are 6 very large purchases involving more than 30% of the equity. As such large acquisitions trigger a mandatory tender offer for all shares outstanding, we also run the regressions without these trades. However, this does not change any of the results in models 4-8.

statistical significance). The adjusted R^2 for Model 4 is more than double than that for Models 1 and 2 without the control dummies.

Panel B of Table V investigates the impact of the relative power of the different categories of blockholders on the CARs. We now focus on the effect of the *dominant* blockholder type (as opposed to the effect of the presence of a blockholder type regardless of its relative size). A particular type of blockholder is dominant, if the sum of the shareholdings of this category is larger than that of any other category.[32] Since this set of dummy variables is mutually exclusive, only one dummy variable is equal to one at a time and the dummy variables for all the other categories are equal to zero. Once we have determined which specific category of shareholder dominates a firm, we also use interaction terms that indicate whether the other categories of owners are also among the firm's blockholders.[33]

Panel B provides additional support for Hypothesis 5: the presence of dominant institutional investors strengthens the positive market reaction to director's share purchases. The interaction terms of dominant institutional investors with other types of blockholders show that the above effect is largely neutralised when corporations or directors hold large share blocks. This provides further evidence for Hypotheses 4 and 6a. Monitoring blockholders reduce information asymmetry and increased directors' entrenchment accounts for the negative effect of directors' block ownership. Panel B also shows direct evidence supporting hypothesis 4: when individuals or families are the dominant blockholder, the information gap is reduced as the positive market reaction to directors' purchases is less strong.

Hypothesis 6a implies that the positive effect of directors' purchases on the share price is reduced when directors dominate the firm as they may pursue their personal objectives when running the firm. The coefficient on dominant directors (Panel B of Table V) is no longer statistically

[32] When we only consider the largest blockholder by category of owner (rather than the sum of the category's shareholdings), our results remain largely similar. This is due to the fact that in most companies, there is only one large blockholder within a specific category.

significant (which is caused by the fact that there are few companies with dominant directors and that the negative effect of directors' blockholdings is already captured by the interaction terms). Panel B fails to support hypothesis 6b which states that the danger of potential entrenchment by the directors is offset by the presence of monitoring outside blockholders (corporations, or individuals and families).

Poor corporate performance and near-insolvency is also expected to influence the information content of directors' purchase signals. Models 6-8 in Panel C (Table V) are similar to those in Panel A, but include additional regressors consisting of interaction terms between director categories and blockholder types on the one side, and poor performance and/or financial distress, on the other side. We measure poor performance and financial distress by dummy variables that are set to one if there are earnings losses (Model 6), low interest coverage (Model 7)[34] and decreased or omitted dividends (Model 8), respectively. These variables are expected to trigger more intensive shareholder or creditor monitoring. We find that directors' purchases cause positive CARs which are substantially higher when the company incurs losses or is financially distressed (see the interaction terms of directors' types and losses/interest coverage in Models 6 and 7). Thus, in situations of poor performance and near-insolvency, the market interprets directors' purchases as positive signals. This supports Hypothesis 7.

The parameter estimates of the blockholder dummies in Models 6-8 of Panel C are similar to those in Panel A, but the interaction terms of ownership concentration with poor performance (measured by earnings losses and dividend reductions) or with near-insolvency (low interest coverage) are not significant. The fact that in poorly performing companies with strong outsiders and directors, who could facilitate corporate recovery, the directors' trading signal is not stronger suggests that the market does not expect that the blockholders will turn around the firm. This finding fails to support Hypothesis 8. This result is not at all surprising as poor performance may not only be the

[33] We multiply the dominant blockholder dummy by the dummies for individual blockholder categories.

consequence of poor management but also of poor blockholder monitoring. To conclude, it seems that in the wake of poor performance, the signal of directors' purchasing shares is important irrespective of the shareholder structure.

Table VI documents how ownership structure affects the market reaction to directors' sales. Panel A captures the overall effect of blockholder categories, whereas Panel B focuses on the relative power of blockholders and takes into account the type of dominant blockholder. Panel C controls of poor performance and insolvency.

Panel A confirms that the information content of sales is much lower than that of purchases. As stated in Hypothesis 1c, directors' sales are less informative as some of the sales may be due to liquidity needs. Model 9 in Panel A shows that the negative signal of directors' sales is much stronger in smaller firms. Lakonishok and Lee (2001) observe the same pattern for the US. This pattern may be due to the higher uncertainty about smaller firms as they are followed by fewer analysts or the increased liquidity of all the shares outstanding. The presence of specific categories of blockholders has little impact on the CARs, with one exception: the directors. When directors are blockholders, a reduction in the directors' control concentration (and hence the reduced potential for reaping private benefits of control) is positively received by the market and reduces the negative signal of the directors' sales. This finding supports Hypothesis 6a.[35]

In Panel B of Table VI we distinguish between dominant and other blockholders. As in Panel B of Table V, a particular blockholder type is dominant if the sum of the shareholdings for this category is larger than that for any other category. The presence of institutional investors reinforces the (negative) informational content conveyed by directors' sales. This suggests that institutional investors do not bridge the informational gap between directors and the market. The results support Hypothesis 4.

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[34] The interest coverage becomes dangerously low when it falls below 2. At this stage a firm's bonds typically lose investment grade (Copeland, Koller and Murrin (1995)).

[Insert Table VI about here.]

Panel C of Table VI tests Hypothesis 7 on the stronger informational content of directors' sales in poorly performing firms. We employ a set of interaction terms between ownership, on one side, and losses (Model 11), low interest coverage (Model 12), and dividend decreases/omissions (Model 13), respectively, on the other side. The results support Hypothesis 7. The information effect of directors' sales is stronger for companies with losses and a low interest coverage (as reflected by the interaction term between incumbent directors and losses/low interest coverage in Models 11 and 12). Finally, Panel C shows that the signal is stronger when there are multiple sales and for smaller firms.

Table VII gives an overview of the hypotheses and summarizes the results.

[Insert Table VII about here.]

V. Robustness checks

The above analysis studies the market impact of directors' transactions in isolation without considering the possible release of news prior to the trade.[36] To analyze the potential contamination effect of news releases, we use the online Regulatory News Service (RNS) and its archives, LexisNexis, Thomson Financial, Reuters, Bloomberg, Jordan's Database. Given that the archives of the Regulatory News Service (of the London Stock Exchange) have only been available since 1995, we re-estimate our results for the second half of our period – namely 1995-1998 – by controlling for news releases. For all the firms in our dataset we collect a total of 15,138 news releases over the four-year period. We categorize these news items into the following classes.

We eliminate duplicate news items (e.g. when Reuters disseminates the exact text from the Regulatory News Announcements). Information originates from two main original sources: 1.

[35] Model 9 does not include the sales transaction value as it was highly correlated with firm size and book-to-market ratio.

information issued by the firms in the form of annual reports, preliminary results and corporate announcement (e.g. press interviews with management) as well as the comments or analysis of this information by brokers (brokerage reports), by journalists (financial press) or by equity analysts and 2. information from the Regulatory News Service (related to M&As, legal disclosure requirements, changes to the board, corporate restructurings etc.)

The first class relates to changes to the board of directors and/or the audit firm/corporate advisors: (i) a change in the CEO, (ii) the departure/appointment of non-executive directors, (iii) the replacement of an executive director (excluding the CEO), and (iv) a change in the firm's advisors such as the auditors, solicitors, registrars, financial advisers or stockbrokers. The second class covers news relating to corporate and equity capital restructuring: (i) M&A activity, (ii) a major disposal of part of the business, division or important assets, (iii) a share repurchase, (iv) a change in equity capital (including a new stock issue to pay off existing debt). A third class covers news on the prospects of the firm, changes in its outlook and other business events: (i) a forward-looking statement about the company's performance, (ii) a name change of the firm, (iii) a business event containing any news item that is deemed to be price sensitive but not falling into any of the preceding categories (e.g.. the signing of a new contract, a reduction in the number of employees, a product launch, a change in accounting policy, a debt roll-over, a move to the AIM market , a change of sector etc.).

Table VIII shows that 27% of all news items relate to changes to the board of directors or to the advisors of the firm. Almost 14% of the information is related to corporate restructurings such as mergers and acquisitions, the acquisition of a minority stake, the acquisition of a division of another firm, the creation of a joint venture, etc. About 4% of news items relate to asset disposals. While a small number of news items is about changes in equity capital or name changes, the bulk of the information releases (about 35%) relate to the firm's prospects.

[36] We are grateful to the referee for suggesting further analysis along these lines.

[Insert table VIII about here]

We test the robustness of the above models (models 1-13) by including dummy variables capturing the release of news 2, 7, and 30 days, respectively, prior to the directors' transactions. We find that our previous findings from tables II-VI are upheld. Table IX shows that if news regarding a merger or acquisition is released within the 7 or 30 days prior to the director's purchase, the market reaction to purchase transactions is close to zero. This suggests that a director's purchase does not contain much additional information after an M&A announcement. The same is valid for equity buy backs and the replacement of a CEO.[37]

[Insert table IX about here]

As shown in section 4, directors' sales are less informative than their purchases. There is little impact of news releases on the market effect of sales. Only when directors sell equity immediately after the replacement of executive directors is the negative sales signal strengthened. This suggests that the sales signal corrects earlier (usually positively received) news of director replacement. Apart from this finding, the above results are upheld.

Although the abnormal returns are corrected for non-synchronous trading (Dimson and Marsh (1986)), our results may still be biased because of a correlation between the CARs and thin trading.[38] No or limited trading over specific periods may prevent the information conveyed by directors' transactions from being incorporated in the share price. We therefore set up a simple test: we collect the number of non-trading days for each firm and classify firms into two categories: those with above-median thin trading (number of non-trading days above the median) and those with below-median thin trading (number of non-trading days below the median. We find that the announcement effect of directors' transactions is related to thin-trading. For purchases, the CAAR(0,1) is 3.5% for the firms with below-median thin trading compared to 2.7% for those with

[37] The estimation results of models 5-8 with the news dummies are not reported in tabular form. However, all the tables are available on request from the authors.

above-median thin trading. Likewise, for sales, the announcement effect for firms with more thin trading is more substantial in absolute value (with a CAAR(0,1) of –0.6%) than that for firms with less thin trading (-0.2%). By including a thin trading dummy (which equals one if the number of non-trading days is above the median) in models 1-13, we find that the market is more receptive to signals derived from directors' trading in firms with more liquid trading. However, all the results from section 4 are upheld.[39]

VI. Conclusions

The main contribution of this study is the analysis of the impact of corporate control on the information content of directors' trading. Several important conclusions emerge from this analysis. First, consistent with most of the existing UK and US studies, directors' purchases and sales trigger significant immediate market reactions of 3.12 percent and –0.37 percent, respectively, measured over the two-day window starting with the announcement day. The higher market reaction to purchases suggests that the market discounts the information content of sales more, because part of the directors' sales may be due to liquidity needs.

Second, when several directors trade on the same day, the announcement reaction is stronger. As directors' are banned from trading prior to earnings announcements it is clear that insiders trade on more information than that contained in the earnings announcement and/or earnings announcements do not convey all available information on the company. The existence of a trading during certain periods does not appear to curtail the value of the signal.

Third, we do not find support for the information hierarchy hypothesis. Although CEOs are assumed to have the best knowledge about their company's prospects, we find that the information

[38] We are grateful to the referee for pointing this out.

[39] All tables are available upon request. The correlation coefficients between share liquidity and control concentration by category of shareholder are positive but below 0.1. As expected, the correlation between liquidity and the free float is negative (but only 0.08). However, the inclusion of a Herfindahl index in all our models – which captures the distribution of the ownership concentration – does not change the results and its coefficient is not statistically significant.

content of CEO trades is lower than that of other director categories. Moreover, when former directors (who left the board within the financial year preceding the transaction) purchase shares, the market reaction is larger than that to purchases by other categories of directors. The reason may be that the purchases by the former directors act as a signal of their confidence in the remaining, incumbent management of the firm. In contrast, the market reaction to sales by former directors is on average insignificant, presumably because the market considers such transactions to be motivated by reasons of personal wealth diversification. However, in small companies, where the information asymmetry between insiders and the market is more substantial, sales by former directors trigger significantly negative market reactions.

Fourth, there is a strong relation between the presence of specific categories of blockholders and the price reaction to the directors' transaction. It is important to distinguish between blockholdings held by directors and different types of outsiders. Additionally, it is also important to distinguish between blockholders who are likely to monitor the management (e.g. corporations, individuals and families unrelated to the directors) and those who are not (institutional investors). If corporations, or individuals or families are blockholders, then the price reaction to directors' purchases is reduced. This suggests that the presence of these blockholders reduces informational asymmetry. In contrast, the presence of institutional investors causes the opposite effect. This implies that institutional investors do not reduce the information gap between shareholders and directors. Although the presence of institutional investors strengthens the negative sales signal, the result is less strong than for the purchases.

Fifth, the market reacts to the increase or decrease in directors' entrenchment. Generally, the positive impact of directors' purchases is reduced when the directors already own substantial stakes. Conversely, the market pressure resulting from directors' sales is less.

All in all, this paper provides strong evidence that the market takes into account the firm's control structure when it evaluates a director's trade. However, the control structure does not play a role in

poorly performing or financial distressed firms. In such firms, directors' trades always emit strong signals about the future prospects (perhaps even about the likelihood of survival) irrespective of any potential entrenchment effect.

References

Admati, Anat R., Pfleiderer, Paul, and Zechner, Josef, 1994, Large Shareholder Activism, Risk Sharing, and Financial Market Equilibrium, Journal of Political Economy 102 (6), 1097-1130.

Barber, Brad, and Lyon, John D., 1997, Detecting Long-run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics, Journal of Financial Economics 43, 341-372.

Bernard, Victor L., 1987, Cross-Sectional Dependence and Problems in Inference in Market-Based Accounting Research, Journal of Accounting Research 25 (1), 1-48.

Bettis J. C., Coles, J. L. and Lemmon, M. L., 2000, Corporate Policies Restricting Trading by Insiders, Journal of Financial Economics 57, 191-220.

Brown, Stephen J., and Warner, Jerold B., 1985, Using Daily Stock Returns: The Case of Event Studies, Journal of Financial Economics 14, 3-31.

Campbell, Cynthia, and Wasley, Charles E., 1993, Measuring Security Price Performance Using Daily NASDAQ Returns, Journal of Financial Economics 33, 73-92.

Campbell, J.Y., Lo, A. and MacKinlay, A.C., 1997. The Econometrics of Financial Markets, (Princeton University Press, Princeton, N.J).

Chang, Saeyoung, and Suk, David Y., 1998, Stock Prices and Secondary Dissemination of Information: The Wall Street Journal's 'Insider Spotlight' Column, Financial Review 33, 115-128.

Conyon, Martin J., and Murphy, Kevin J., 2000, The Price and the Pauper? CEO Pay in the U.S. and U.K., Economic Journal 110, 640-671.

Copeland, T., Koller, T., and Murrin, J., 1995. Valuation: Measuring and Managing the Value of Companies, (Wiley, New York).

Corrado, Charles J., 1989, A Nonparametric Test for Abnormal Security-Price Performance in Event Studies, Journal of Financial Economics 23, 385-395.

Dedman, E., 2004, Discussion of Reactions of the London Stock Exchange to Company Trading Statement, Journal of Business Finance & Accounting 31, 37-47.

Dimson, Elroy, 1979, Risk Measurement when Shares are Subject to Infrequent Trading, Journal of Financial Economics 7, 197-226.

Dimson, Elroy, and Marsh, Paul, 1986, Event Study Methodologies and the Size Effect, Journal of Financial Economics 17, 113-142.

Dyck, Alexander, and Zingales, Luigi, 2003, Private benefits of control: An international comparison, Journal of Finance, forthcoming.

Faccio, M. and Lasfer, M. A., 2000, Do occupational pension funds monitor companies in which they hold large stakes?, Journal of Corporate Finance 6, 71-110.

Faccio, M., and Lasfer, M. A., 2002, Institutional shareholders and corporate governance: the case of U.K. pension funds, in J. McCahery et al. (eds.), Corporate Governance Regimes: Convergence and Diversity, (Oxford University Press: Oxford), 603-624.

Franks, Julian, and Nyborg, Kjell, 1996, Control rights, debt structure and the loss of private benefits: the case of the U.K. insolvency code, Review of Financial Studies 9 (4), 1165-1210.

Franks, Julian, Mayer, Colin, and Renneboog, Luc, 2001, Who Disciplines Management in Poorly Performing Companies?, Journal of Financial Intermediation 10, 209-248.

Friederich, Silvain, Gregory, Alan, Matatko, John, and Tonks, Ian, 2002, Short-Run Returns around the Trades of Corporate Insiders on the London Stock Exchange, European Financial Management 8 (1), 7-30.

Goergen, M. and Renneboog, L. (2001), Strong managers and passive institutional investors in the UK, in F. Barca and M. Becht (eds.), The control of corporate Europe, (Oxford University Press: Oxford), 258-284.

Gregory, Alan, Matatko, John, and Tonks, Ian, 1997, Detecting Information from Directors' Trades: Signal Definition and Variable Size Effects, Journal of Business Finance and Accounting 24(3), 309-342.

Gregory, Alan, Matatko, John, Tonks, Ian, and Purkis, Richard, 1994, U.K. Directors' Trading: The Impact of Dealings in Smaller Firms, Economic Journal 104, 37-53.

Hillier, David, and Marshall, Andrew P., 1998, The Timing of Directors' Trades, Journal of Business Law, 454-467.

Hillier, David, and Marshall, Andrew P., 2002, Are Trading Bans effective? Exchange Regulation and Corporate Insider Transactions around Earnings Announcements, Journal of Corporate Finance 8, 393-410.

Holderness, Clifford G., and Sheehan, Dennis, 1988, The Role of Majority Shareholders in Publicly Held Corporations, Journal of Financial Economics 20, 317-346.

Hu, Jie, and Noe, Thomas, 1997, The insider trading debate, Federal Reserve Bank of Atlanta Economic Review (Fourth Quarter), 34-45.

Jaffe, Jeffrey F., 1974, Special Information and Insider Trading, Journal of Business 47 (3), 410-428.

Jain, Prem, 1986, Analyses of the Distribution of Security Market Model Prediction Errors for Daily Returns Data, Journal of Accounting Research 24 (1), 76-96.

Jeng, Leslie A., Metrick, Andrew, and Zeckhauser, Richard, 1999, The Profits to Insider Trading: A Performance-Evaluation Perspective, NBER Working Paper No. 6913.

Jensen, Michael, and Meckling, William, 1976, Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure, Journal of Financial Economics 3, 305-360.

Johnson, Simon, La Porta, Rafael, Lopez-de-Silanes, Florencio, and Shleifer, Andrei, 2000, The Near Crash of 1998 – Tunneling, American Economic Review 90, 22-27.

King, M., and Roell, Ailsa, 1988, Insider Trading, Economic Policy 7, 163-193.

Lai, J. and S. Sudarsanam, 1997, Corporate restructuring in response to performance decline: impact of ownership, governance and lenders, European Finance Review 1, 197-233.

Lakonishok, Josef, and Lee, Inmoo, 2001, Are Insiders' Trades Informative?, Review of Financial Studies 14 (1), 79-112.

Lakonishok, J., Shleifer, Andrei, and Vishny, Robert W., 1994, Contrarian Investment, Extrapolation, and Risk, Journal of Finance 49 (5), 1541-1678.

Leland, Hayne E., 1992, Insider trading, should it be prohibited?, Journal of Political Economy 100, 859-887.

Lin, Ji-chai, and Howe, John, 1990, Insider Trading at the OTC Market, Journal of Finance 52, 1273-1284.

Lustgarden, Steven, and Mande, Vivek, 1995, Financial analysts' earnings forecasts and insider trading, Journal of Accounting and Public Policy 14, 233-261.

MacKinlay, A. Craig, 1997, Event Studies in Economics and Finance, Journal of Economic Literature 35, 13-39.

Maug, Ernst, 1998, Large Shareholders as Monitors: Is there a Trade-Off between Liquidity and Control? Journal of Finance 53 (1), 65-98.

Morck, Randall, Andrei Shleifer, and Vishny, Robert W., 1988, Management Ownership and Market Valuation: An Empirical Analysis, Journal of Financial Economics 20, 293-315.

Peasnell, K., P. Pope and S. Young, 2003, Managerial equity ownership and the demand for outside directors, European Financial Management 9, 231-50.

Persons, Obeua, 1992, SEC's insider trading enforcements and target firms' stock values, Journal of Business Research 39, 187-194.

Pope, P. F., Morris, R. C., and Peel, D. A., 1990, Insider Trading: Some Evidence on Market Efficiency and Directors' Share Dealings in Great Britain, Journal of Business Finance and Accounting 17(3), 359-380.

Renneboog, L. and G. Trojanowski, 2003, The managerial labour market and the governance role of major shareholders in the UK, Working paper CentER, Tilburg University.

Rozeff, Michael S., and Zaman, Mir A., 1988, Market Efficiency and Insider Trading: New Evidence, Journal of Business 61, 25-44.

Scholes, Myron S., and Williams, Joseph, 1977, Estimating Betas from Nonsynchronous Data, Journal of Financial Economics 5, 309-327.

Seyhun, H.Nejat, 1986, Insiders' Profits, Costs of Trading and Market Efficiency, Journal of Financial Economics 16, 189-212.

Figure 1: Market reaction to insider purchases

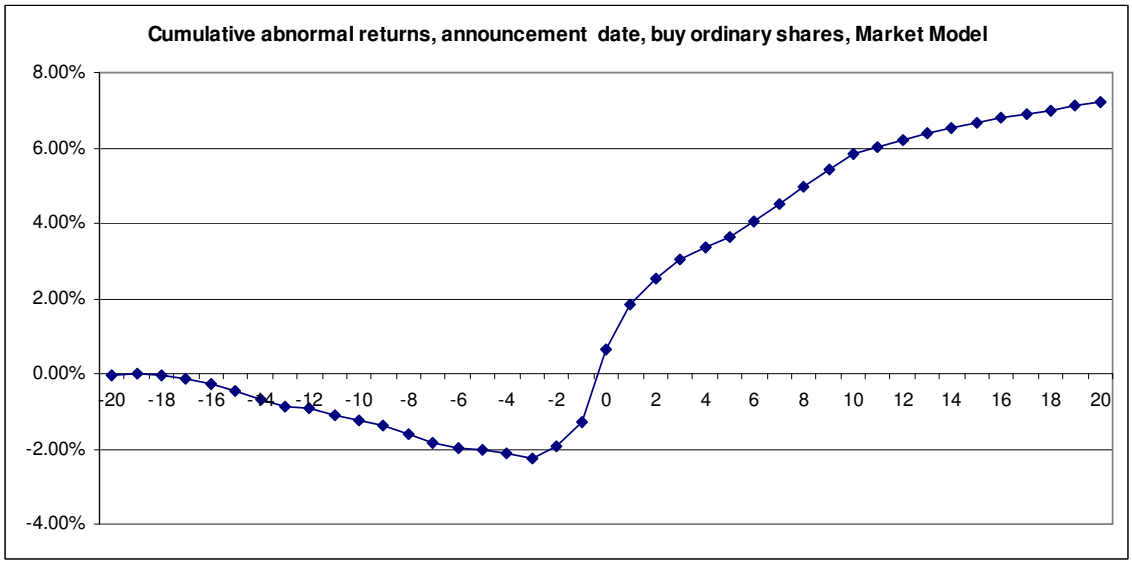

Figure 2: Market reaction to insider sales

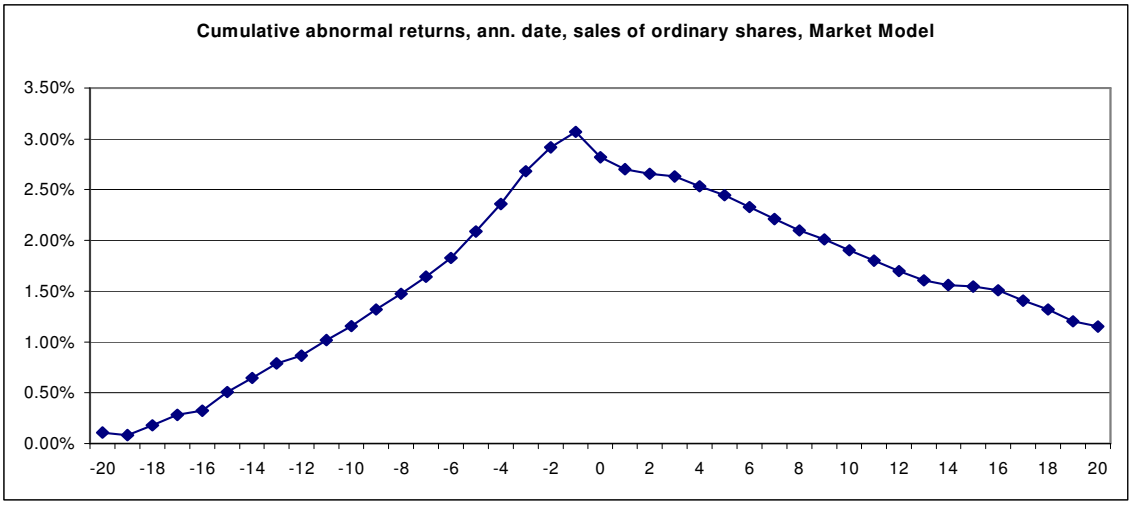

Table I: Summary statistics

Panel A is directly comparable to Table 1 of Lakonishok and Lee (2001) for directors' trades in the US. *'Fraction'* refers to the average annual fraction of firms (as a % of all the non-financial listed firms) with at least 1 directors' trade. *'# of trades'* is the average annual number of trades per firm. *'Total shares transacted – per firm'* is the average annual number of shares transacted per firm. *'% mkt cap – cond.'* is the average ratio of the total annual number of shares transacted to the total number of shares outstanding at the end of each year. *'# of firms'* is the sample size. *'All'* includes purchases, sales and sales directly after an exercise of all ordinary voting shares plus exercise of all voting options. Panels B-D refer to all purchases and sales of UK directors during 1991-98 representing at least 0.1 percent of a company's market capitalization. *'Trade value'* is defined as the total number of shares transacted by directors times the share price at the beginning of the year. *'% market capitalization'* is the ratio of the net number of shares transacted over the number of shares outstanding at the beginning of the year. *'Interest coverage'* is EBIT over total interest expenses. *'CEO', 'Executive', 'Chairman* and *'Other incumbent directors'* represent the dealings of the CEO/managing director, the dealings of the CEO/deputy CEOs/deputy managing directors/financial directors, the board's chairman and those of all incumbent directors that are not executives, chairmen or deputy chairmen, respectively. '*Former directors'* dealings are traced up to 2 months beyond the year in which they left. *'Book-to-market ratio'* is book value of equity over market capitalization. *'Debt-equity ratio'* is book value of long-term debt over book value of equity. a, b: This is the number of transactions for which we have information on the price at which the shares were traded. The number does not add up to the sum of all the transactions.

Panel A: UK sample description (comparable to Lakonishok and Lee (2001) for directors)

	all	purchases	sales	sales post exercise	sales & sales post exercise	exercise
Fraction of firms with directors' trades	0.71	0.51	0.33	0.17	0.50	0.24
# of trades per firm-year	4.26	1.49	0.69	0.40	1.09	0.59
total shares transacted per firm	349,666	93,129	163,036	36,985	200,022	56,515
% mkt cap – cond.	0.69%	0.24%	0.46%	0.09%	0.48%	0.14%
# of firms	1492	1385	1119	690	1203	837

Panel B: Directors' large transactions (>0.1% of market cap.)	**# of trans-actions**	**Mean**	**Std. Dev.**	**Min**	**Max**	**p25%**	**Median**	**p75%**
NET PURCHASES								
trade value (GBP)	1,861[a]	1,075,571	36,500,000	19	1,590m	12,800	36,000	116,030
% market capitalization	1,861	0.96%	3.61%	0.10%	77.45%	0.15%	0.27%	0.58%
% market cap. by category of director								
CEOs	582	1.04%	3.92%	0.10%	77.45%	0.18%	0.31%	0.67%
other top executives	112	1.29%	4.44%	0.10%	44.29%	0.17%	0.28%	0.95%
chairman	492	1.30%	4.07%	0.10%	52.27%	0.19%	0.36%	0.78%
other incumbent directors	606	1.34%	5.33%	0.10%	77.45%	0.15%	0.29%	0.64%
former directors	396	1.51%	6.00%	0.10%	77.45%	0.14%	0.31%	0.81%
NET SALES								
trade value	2,004[b]	890,679	3,881,658	32	79,700m	37,087	147,155	577,760
% market capitalization	2,004	1.38%	2.74%	0.10%	39.05%	0.21%	0.48%	1.28%
% market cap. by category of director								
CEOs	490	1.85%	2.73%	0.10%	18.47%	0.35%	0.82%	1.95%
other top executives	115	1.58%	2.70%	0.11%	14.43%	0.20%	0.54%	1.44%
chairman	350	2.07%	3.94%	0.10%	39.05%	0.32%	0.69%	2.03%
other incumbent directors	766	1.29%	2.60%	0.10%	39.05%	0.20%	0.46%	1.22%
former directors	626	1.55%	2.95%	0.10%	23.62%	0.20%	0.51%	1.36%

Panel C: Accounting variables	**# of firms**	**Mean**	**Std. Dev.**	**Min**	**Max**	**p25%**	**Median**	**p75%**
FIRMS WITH NET PURCHASES								
market capitalization (in million)	551	78	434	0	8,066	7	18	42
number of employees		1,139	3,587	3	62,943	197	431	986
earnings after taxes (in thousands)		1,285	12,435	-93,300	204,300	-142	602	2,221
return on equity		3.99	156.53	-1,859.68	1,944.62	-2.46	8.52	17.41
book-to-market ratio		0.94	1.11	-7.45	10.25	0.36	0.71	1.24
debt-equity ratio		0.41	0.80	-4.89	8.22	0.08	0.24	0.50
interest coverage		71.65	582.19	-992.50	10,777.00	0.61	3.44	9.98
FIRMS WITH NET SALES								
market capitalization (in million)	628	133	297	0	4,010	18	47	142
number of employees		2,089	6,857	5	93,497	230	551	1,426
earnings after taxes (in thousands)		5,935	18,081	-197,200	177,500	622	2,395	6,200
return on equity		-0.95	353.22	-6,775.32	720.68	8.14	15.68	27.41
book-to-market ratio		0.57	0.69	-3.58	7.96	0.24	0.42	0.71
debt-equity ratio		0.09	3.96	-97.53	13.46	0.04	0.16	0.34
interest coverage		73.46	444.33	-3,878.67	6,204.99	3.54	8.87	23.50

Table I continued

Panel D: Ownership structure	**# of firms with blocks in that category**	**% of all firms**	**Mean**	**Std.dev.**	**Min**	**Max**	**p25%**	**Median**	**p75%**
FIRMS WITH NET PURCHASES									
all blockholders with more than 5%	378	69%	41.6%	18.2%	2.6%	97.0%	28.3%	40.9%	54.4%
all outsiders	356	65%	28.2%	16.2%	2.0%	97.0%	16.8%	26.0%	37.4%
corporations	98	18%	14.5%	14.2%	1.5%	76.3%	5.0%	8.7%	19.8%
institutional investors	328	60%	22.6%	14.7%	2.0%	81.8%	11.2%	19.8%	31.6%
individual outsiders	130	24%	9.2%	6.6%	1.1%	34.2%	5.0%	7.5%	11.5%
all directors	230	42%	24.8%	19.7%	1.0%	77.6%	8.2%	18.2%	38.2%
FIRMS WITH NET SALES									
all blockholders with more than 5%	417	66%	34.5%	19.0%	2.0%	89.0%	18.6%	32.2%	47.2%
all outsiders	391	62%	22.0%	14.2%	1.1%	65.6%	11.4%	18.6%	29.7%
corporations	87	14%	13.6%	12.8%	0.9%	50.0%	3.8%	8.5%	19.9%
institutional investors	351	56%	18.2%	11.9%	1.1%	62.3%	9.1%	16.4%	25.3%
individual outsiders	102	16%	10.0%	8.0%	0.9%	34.7%	4.6%	7.0%	13.6%
all directors	252	40%	23.0%	18.7%	1.1%	88.0%	7.9%	16.5%	33.2%

Table II: Market reaction to directors' transactions (announcement day)

This table reports the cumulative average abnormal returns (CAAR) to directors' purchases or sales of ordinary voting shares that represent at least 0.1 percent of a company's market capitalization. CAARs are estimated using the market model, the market adjusted model, and the size-adjusted model of Lakonishok et al. (1994). The β_i's are estimated over days –200 to –21. The tests are described in the methodology section. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. [a] The number of observations across models differs because each model requires different daily returns and consequently some events are excluded since abnormal returns cannot be computed.

Panel A: Large net purchases (>0.1%)	**CAAR (-20;-1)**	**CAAR (0;1)**	**CAAR (0;3)**	**CAAR (0;5)**	**CAAR (0;20)**	**# obs.[a]**
Market model						
CAAR	-1.27%***	3.12%***	4.30%***	4.88%***	8.47%***	1861
t_{CAAR}	-2.66	14.84	17.06	17.08	19.69	
J_1	-3.63	28.29	27.55	25.54	23.67	
J_2	-11.81	41.30	40.84	38.24	36.81	
t_{rank}	-2.50	9.17	9.34	8.25	7.82	
Market-adjusted model						
CAAR	-2.78%***	2.94%***	3.91%***	4.30%***	6.27%***	1889
t_{CAAR}	-5.96	14.23	16.01	15.74	16.19	
J_1	-7.78	26.05	24.53	22.03	17.14	
J_2	-11.99	29.45	28.30	25.28	19.69	
t_{rank}	-2.82	8.15	8.81	8.27	8.15	
Size-adjusted model						
CAAR	-3.27%***	2.89%***	3.94%***	4.36%***	6.78%***	1686
t_{CAAR}	-6.44	13.10	14.98	14.72	15.99	
J_1	-8.59	24.04	23.14	20.93	17.40	
J_2	-13.56	27.63	26.73	23.87	20.55	
t_{rank}	-1.66	8.78	8.93	8.13	8.65	
Panel B: Large net sales (>0.1%)	**CAAR (-20;-1)**	**CAAR (0;1)**	**CAAR (0;3)**	**CAAR (0;5)**	**CAAR (0;20)**	**# obs.[a]**
Market model						
CAAR	3.07%***	-0.37%***	-0.44%***	-0.62%***	-1.92%***	2004
t_{CAAR}	8.68	-4.69	-4.18	-4.81	-7.75	
J_1	14.38	-5.42	-4.62	-5.32	-8.78	
J_2	22.74	-7.01	-6.28	-6.49	-9.58	
t_{rank}	7.58	-4.92	-4.34	-3.76	-5.42	
Market-adjusted model						
CAAR	4.55%***	-0.21%***	-0.12%	-0.10%	-0.13%	2024
t_{CAAR}	13.41	-2.63	-1.11	-0.74	-0.55	
J_1	20.22	-2.90	-1.16	-0.77	-0.56	
J_2	22.98	-4.04	-2.69	-1.69	-1.16	
t_{rank}	7.01	-4.81	-4.53	-3.79	-5.27	
Size-adjusted model						
CAAR	4.93%***	-0.24%***	-0.15%	-0.19%	-0.15%	1642
t_{CAAR}	12.29	-2.72	-1.23	-1.30	-0.55	
J_1	19.51	-3.06	-1.31	-1.38	-0.59	
J_2	20.99	-4.55	-2.95	-2.42	-0.97	
t_{rank}	6.63	-4.03	-3.39	-3.30	-4.42	

Table II continued

Panel C:	**CAAR (-20;-1)**	**CAAR (0;1)**	**CAAR (0;3)**	**CAAR (0;5)**	**CAAR (0;20)**	**# obs.[a]**
All net purchases						
CAAR(market model)	-2.01%	1.16%	1.55%	1.75%	3.28%	10140
t_{CAAR}	-13.38	20.78	22.25	21.84	24.27	
J_1	-18.71	34.15	32.30	29.86	29.81	
J_2	-35.21	42.21	40.80	38.42	37.59	
t_{rank}	-6.73	7.65	7.68	6.85	6.55	
All net sales						
CAAR(market model)	2.29%	-0.26%	-0.39%	-0.56%	-1.60%	5523
t_{CAAR}	13.54	-6.05	-6.84	-8.32	-12.21	
J_1	20.89	-7.38	-7.92	-9.28	-14.25	
J_2	29.98	-8.23	-10.30	-10.89	-15.52	
t_{rank}	8.96	-4.51	-4.94	-4.68	-6.01	
Panel D:	**CAAR (-20;-1)**	**CAAR (0;1)**	**CAAR (0;3)**	**CAAR (0;5)**	**CAAR (0;20)**	**# obs.[a]**
Small net purchases (<0.1%)						
CAAR (market model)	-2.18%	0.79%	1.02%	1.15%	2.30%	8378
t_{CAAR}	-14.30	15.62	15.76	15.57	17.39	
J_1	-20.74	23.82	21.64	20.04	21.37	
J_2	-34.14	28.93	27.16	25.82	25.51	
t_{rank}	-7.56	6.52	6.44	5.78	5.62	
Small net sales (<0.1%)						
CAAR (market model)	1.84%	-0.25%	-0.44%	-0.60%	-1.54%	3519
t_{CAAR}	10.8129	-6.59	-7.42	-8.82	-10.62	
J_1	15.6179	-6.87	-8.26	-9.38	-12.78	
J_2	20.4953	-7.17	-9.76	-10.23	-13.58	
t_{rank}	8.2856	-3.96	-4.85	-4.84	-5.72	

Table III: Market reaction to directors' purchases according to director categories

Panel A reports the market model-based CAARs of directors' share purchases (of at least 0.1% of the market capitalization). The announcement day is day 0. *'CEOs'* and *'Chairmen'* stand for the CEO/managing director and chairman, respectively. '*Top executive directors'* represents the CEO, deputy CEOs, and financial directors. '*Other incumbent directors'* are all directors not included in previous categories. *'All incumbent directors'* comprise CEOs, top executive directors, chairmen, and other incumbent directors. *'Former directors'* refers to former directors whose trades are traced up to 2 months subsequent to the year in which they left the firm. In Panel B, the dependent variable is CAAR(0,1). All coefficients are adjusted for heteroscedasticity (White procedure). *'CEO'* equals 1 if the CEO purchases shares. *'CEO – multiple purchases'* is set to 1 when a CEO and at least 1 other director purchase on the same day. *'Other top executives'* is 1 when a deputy CEO/managing director, or the finance director purchase while the CEO does not. *'Chairman'* equals 1 if he buys while the CEO or other executives do not. *'Other incumbent directors'* is 1 if directors (excluding the CEO, another executive, or the chairman) buy while no CEO, other executive, or chairman buys. *'Former directors'* is set to 1 if a former director buys while no incumbent director buys. *'Other top executives (chairmen, other incumbent directors, or former directors) – multiple purchases' equals 1* if at least 1 director of that category buys while another director also buys. *'Multiple purchases'* is set to 1 if more than one director buys on the same day. *'Transaction size'* is the total number of shares bought by directors (over a day) over the total number of shares outstanding at the beginning of the year. *'Mrkt. capitalization'* is the total number of shares outstanding at the beginning of the year times the share price on the first trading day of that year. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. [a] For the (0,1) event window, the difference in CAARs for CEO and former directors is significantly different at the 5% level (t=2.07), as is the differences in CAARs of CEOs and other incumbent directors at 10% (t=1.91).

Panel A: CAARs by director type

Event window		CAAR (-20;-1)	CAAR (0;1)	CAAR (0;3)	CAAR (0;5)	CAAR (0;20)	# obs.
CEOs		-2.76%***	2.38%***[a]	3.71%***	4.53%***	9.28%***	582
	t-stat	-3.76	6.35	8.55	9.37	11.75	
top executive directors		-2.57%***	2.71%***	4.19%***	4.98%***	9.72%***	677
(CEO, dep. CEO, financial dir.)	t-stat	-3.87	7.54	9.99	10.81	13.18	
chairmen		-1.40%	3.17%***	5.02%***	6.26%***	10.97%***	493
	t-stat	-1.57	6.98	9.02	9.81	11.06	
other incumbent directors		-2.12%***	3.51%***[a]	5.17%***	5.64%***	9.24%***	572
	t-stat	-2.52	7.68	9.53	10.07	11.25	
all incumbent directors		-2.40%***	2.92%***	4.43%***	5.14%***	9.17%***	1591
(Top execs., Chairmen, Other incumbent dirs.)	t-stat	-5.12	11.86	14.81	15.74	18.54	
Former directors		-2.50%**	3.83%***[a]	6.34%***	7.21%***	11.55%***	396
	t-stat	-2.09	6.47	8.61	8.77	9.33	

Panel B: Cross-sectional regression results with CAR(0,1)

	Model 1			Model 2		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant	0.025***	0.0089	2.76	0.023***	0.0089	2.62
CEO – multiple purchases				0.020*	0.0110	1.78
other top executives	0.024**	0.0117	2.03	0.020	0.0129	1.57
other top exec. – multiple purchases				0.034	0.0281	1.20
chairman	0.008	0.0060	1.29	0.010*	0.0060	1.70
chairman – multiple purchases				0.003	0.0201	0.15
other incumbent directors	0.010*	0.0063	1.66	0.012*	0.0061	2.03
other cur. dir's – multiple purchases				0.004	0.0274	0.13
former directors	0.020***	0.0071	2.76	0.021***	0.0075	2.75
former directors – multiple purchases				0.017	0.0211	0.81
multiple purchases	0.015*	0.0080	1.87			
transaction size	-0.216	0.1548	-1.40	-0.214	0.1514	-1.41
mrkt. capitalization	-0.039	0.0322	-1.21	-0.041	0.0369	-1.10
year and industry dummies	yes			yes		
Adj. R^2	1.40%			1.29%		
F	2.59***			1.96***		
number of observations	1905			1905		

Table IV: Market reaction to directors' sales according to director categories

Panel A reports the market model-based CAARs of directors' share sales (of at least 0.1% of the market capitalization). The announcement day is the event day. The variables are defined in Table III.
[a] For the (0,1) event window, the difference in CAARs for current and former directors is significantly different at 10% significance level. All other pair-wise tests on differences of CAARs (0;1) are not statistically significant.
The definitions in Panel B are similar to those in Panel B of Table III, but refer to sales rather than purchases. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Panel A: CAARs by type of director

Event window	**CAAR (-20;-1)** t-stat	**CAAR (0;1)** t-stat	**CAAR (0;3)** t-stat	**CAAR (0;5)** t-stat	**CAAR (0;20)** t-stat	**# obs.**
CEOs	3.49%***	-0.42%***	-0.58%***	-0.81%***	-1.83%***	490
	5.96	-2.86	-2.66	-2.98	-3.52	
top executive directors	3.42%***	-0.48%***	-0.67%***	-0.95%***	-2.17%***	563
(CEO, dep. CEO, financial dir.)	5.88	-3.26	-3.17	-3.60	-4.35	
chairmen	3.19%***	-0.50%***	-0.56%***	-0.88%***	-1.79%***	350
	4.72	-3.15	-2.46	-3.17	-3.10	
other incumbent directors	3.05%***	-0.59%***	-0.77%***	-1.06%***	-2.23%***	684
	4.97	-4.52	-4.48	-4.97	-4.96	
all incumbent directors	3.31%***	-0.46%***	-0.59%***	-0.84%***	-2.10%***	1476
(Top execs., Chairmen, Other incumbent dirs.)	8.76	-5.26	-5.05	-5.73	-7.18	
former directors	2.61%***	-0.16%[a]	-0.20%	-0.18%	-1.62%***	626
	3.53	-1.10	-0.98	-0.77	-3.85	

Panel B: Cross-sectional regression results with CAR(0,1)

	Model 3		
	coef.	std.dev.	t-stat.
constant	-0.004	0.0025	-1.54
other top executives	-0.004	0.0056	-0.74
chairman	-0.001	0.0023	-0.43
other incumbent directors	-0.001	0.0021	-0.36
former directors	0.002	0.0025	0.83
multiple sales	-0.005**	0.0023	-2.12
transaction size	0.068	0.0647	1.05
mrkt. capitalization	-0.700	0.4662	-1.50
year and industry dummies	yes		
Adj. R^2	0.52%		
F	1.20		
number of observations	1993		

Table V: Market reaction to directors' purchases and control structure: cross-sectional results

The dependent variable is as defined in Panel A of Table III. *'Concentrated blockholder – corporations, institutional investors, individuals / families and directors'* are dummy variables. All these dummy variables equal 1 if a blockholder of the corresponding type holds a stake of at least 5% of the equity and is 0 otherwise. *'Dispersed ownership'* is a dummy which is set to one if the firm does not have a blockholder. *'Dominant blockholder group – corporation, institutional investor, individual and insider'* are dummy variables set to 1 if the sum of all the blocks of that type of blockholder is the largest compared to the combined stakes of other blockholder types. *'With corporation, fin. institution, individual, or directors present'* is an interaction term between the 'dominant' blockholder dummy and a 'concentrated' blockholder dummy of another type. Director categories are defined as in Panel B of Table III. *'Transaction value'* is defined as natural log of total number of shares transacted by directors times price per share at the beginning of the calendar year. *'Size'* is the natural log of total number of employees at the beginning of the year. *'B/M ratio'* is defined in table III. *'Profitability'* and *'Leverage'* are respectively the ROE and the D/E ratio at the beginning of the year. *'Loss'* equals 1 if the EAT in the previous year is negative. *'Low interest coverage'* equals 1 if the interest coverage at the beginning of the year is below two. *'Dividend decrease'* is set to 1 if the firm decreased or omitted the dividend over the previous year. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Panel A: Model 4			**Panel B: Model 5**		
	coef.	**t-stat.**		**coef.**	**t-stat.**
constant	0.050**	2.16	constant	0.044*	1.95
other top executives	0.016	1.51	other top executives	0.015	1.35
chairmen	0.002	0.36	chairman	0.003	0.52
other incumbent directors	0.009	1.16	other incumbent directors	0.009	1.18
former directors	0.015**	2.00	former directors	0.016**	2.15
concentrated blockholder			dominant blockholder group		
corporations	-0.021***	-2.84	dominant corporations	0.007	0.28
institutional investors	0.013***	2.29	with financial inst. present	-0.016	-0.69
individuals / families	-0.010	-1.58	with indiv's/families present	0.021	1.04
directors	-0.014***	-2.59	with directors present	-0.027	-1.21
			dominant institutional investors	0.027***	3.08
			with corporation present	-0.029**	-2.90
			with indiv's/families present	-0.013	-1.15
			with directors present	-0.026***	-3.10
			dominant individuals/families	-0.021**	-2.28
			with financial inst. present	0.019	0.94
			dominant directors	0.011	1.26
			with corporation present	-0.058**	-2.20
			with financial inst. present	-0.006	-0.67
			with indiv's/families present	-0.017*	-1.75
multiple purchases	0.014	1.56	multiple purchases	0.014	1.62
transaction value	-0.001	-0.67	transaction value	-0.002	-0.70
size	-0.001	-0.20	size	0.000	-0.16
B/M ratio	-1.609	-0.86	B/M ratio	-2.289	-1.22
profitability	1.687***	2.41	profitability	1.644**	2.29
leverage	0.002	0.94	leverage	0.003	0.98
year and industry dummies	yes		year and industry dummies	yes	
Adj. R^2	3.35%		Adj. R^2	4.57%	
F	2.15***		F	2.06***	
number of observations	1428		number of observations	1428	

Table V continued

Panel C:	**Model 6 loss**			**Model 7 low int. coverage**			**Model 8 div. decrease**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant	0.045*	0.0230	1.95	0.044*	0.0233	1.87	0.048**	0.0234	2.04
other top executives	0.012	0.0114	1.07	0.015	0.0125	1.17	0.009	0.0107	0.89
chairman	-0.004	0.0066	-0.58	-0.006	0.0071	-0.89	0.002	0.0073	0.34
other incumbent directors	0.007	0.0076	0.94	0.010	0.0079	1.28	0.007	0.0082	0.85
former directors	0.024***	0.0090	2.66	0.023***	0.0094	2.47	0.017**	0.0085	2.02
concentrated blockholder									
corporations	-0.020***	0.0064	-3.08	-0.020***	0.0068	-2.96	-0.021***	0.0090	-2.38
institutional investors	0.012**	0.0061	1.96	0.014**	0.0063	2.21	0.012**	0.0063	1.97
individuals / families	-0.010	0.0069	-1.38	-0.018***	0.0067	-2.61	-0.011	0.0075	-1.52
directors	-0.011*	0.0062	-1.72	-0.010	0.0061	-1.61	-0.010*	0.0060	-1.70
interaction term: dir.category x performance dummy									
ceo	0.052**	0.0244	2.11	0.038*	0.0213	1.79	0.001	0.0201	0.05
other top executives	0.063**	0.0319	1.97	0.041	0.0277	1.50	0.027	0.0383	0.70
chairman	0.071***	0.0272	2.60	0.056***	0.0228	2.45	-0.003	0.0226	-0.13
other incumbent directors	0.062**	0.0278	2.24	0.035	0.0245	1.41	0.010	0.0222	0.44
former directors	0.023	0.0267	0.87	0.016	0.0236	0.68	-0.013	0.0242	-0.55
interaction term: blockholder x performance dummy									
corporations	-0.011	0.0175	-0.66	-0.011	0.0149	-0.73	0.002	0.0174	0.14
institutional investors	-0.031	0.0200	-1.53	-0.022	0.0172	-1.30	0.006	0.0163	0.40
individuals / families	-0.008	0.0173	-0.48	0.018	0.0149	1.18	0.008	0.0162	0.48
directors	-0.028*	0.0161	-1.72	-0.017	0.0134	-1.25	-0.014	0.0144	-0.94
dispersed	-0.056**	0.0253	-2.22	-0.032	0.0220	-1.46	0.016	0.0250	0.63
multiple purchases	0.013	0.0089	1.48	0.013	0.0090	1.44	0.013	0.0091	1.41
transaction value	-0.001	0.0022	-0.53	-0.001	0.0022	-0.49	-0.001	0.0022	-0.58
size	-0.001	0.0026	-0.21	0.000	0.0026	-0.19	-0.001	0.0026	-0.24
B/M ratio	-2.456	2.0838	-1.18	-2.594	2.0963	-1.24	-1.602	1.9421	-0.82
profitability	1.454**	0.7105	2.05	1.717***	0.7265	2.36	1.518***	0.6639	2.29
leverage	0.002	0.0023	0.99	0.002	0.0024	0.83	0.002	0.0024	0.79
year and industry dummies	yes			yes			yes		
Adj. R^2	4.62%			4.44%			3.74%		
F	2.13***			2.11***			1.69***		
number of observations	1481			1481			1481		

Table VI: Market reaction to insider sales and control structure: cross-sectional results

All variables are as defined in Table V. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Panel A: Model 9	**coef.**	**t-stat.**	**Panel B: Model 10**	**coef.**	**t-stat.**
constant	0.007	1.27	constant	0.005	0.99
other top executives	0.001	0.15	other top executives	0.000	-0.05
chairmen	0.001	0.43	chairman	0.001	0.49
other incumbent directors	0.001	0.32	other incumbent directors	0.001	0.32
former directors	0.004	1.48	former directors	0.004	1.59
concentrated blockholder			dominant blockholder group		
corporations	-0.001	-0.32	dominant corporations	-0.003	-0.57
institutional investors	-0.002	-0.99	with financial inst. present	0.007	0.96
individuals / families	-0.004	-1.63	with indiv's/families present	0.020	1.36
directors	0.004**	2.01	with directors present	-0.009	-1.03
			dominant institutional investors	-0.004*	-1.83
			with corporation present	-0.009*	-1.82
			with indiv's/families present	-0.005	-1.21
			with directors present	0.005**	1.97
			dominant individuals/families	-0.008	-1.24
			with financial inst. present	0.016*	1.65
			with directors present	-0.009	-0.85
			dominant directors	0.002	0.61
			with corporation present	0.010	1.15
			with financial inst. present	0.002	0.42
			with indiv's/families present	-0.007*	-1.69
multiple sales	-0.004	-1.61	multiple sales	-0.004	-1.64
size	-0.002***	-2.36	size	-0.001**	-2.01
B/M ratio	-0.714	-0.80	B/M ratio	-0.880	-0.95
profitability	3.410	1.09	profitability	3.710	1.15
leverage	0.348	0.79	leverage	0.505	1.07
year and industry dummies	yes		year and industry dummies	yes	
Adj. R^2	2.02%		Adj. R^2	3.30%	
F	1.55**		F	1.57**	
number of observations	1681		number of observations	1681	

Table VI continued

Panel C:	**Model 11 loss**			**Model 12 low int. coverage**			**Model 13 div. decrease**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant	0.008	0.0051	1.54	0.008	0.0052	1.55	0.007	0.0049	1.46
former directors	0.002	0.0023	1.00	0.002	0.0023	0.96	0.004	0.0023	1.72
concentrated blockholder									
corporations	0.000	0.0038	0.09	-0.001	0.0038	-0.31	0.000	0.0031	-0.01
institutional investors	-0.001	0.0019	-0.70	-0.002	0.0019	-1.03	0.000	0.0019	-0.11
individuals / families	-0.002	0.0028	-0.79	-0.003	0.0027	-1.14	-0.005*	0.0028	-1.70
directors	0.004**	0.0020	1.96	0.004*	0.0020	1.97	0.003	0.0020	1.54
interaction term: dir.category x performance dummy									
incumbent directors	-0.038***	0.0123	-3.10	-0.031***	0.0115	-2.71	-0.015	0.0161	-0.96
former directors	0.031***	0.0127	2.41	-0.023**	0.0116	-1.98	-0.018	0.0139	-1.27
interaction term: blockholder x performance dummy									
corporations	0.005	0.0084	0.61	0.009	0.0083	1.15	-0.010	0.0175	-0.59
institutional investors	0.020*	0.0109	1.88	0.019*	0.0099	1.88	-0.006	0.0131	-0.49
individuals / families	-0.010	0.0086	-1.18	-0.006	0.0085	-0.69	0.010	0.0101	0.98
directors	0.015*	0.0077	1.93	0.009	0.0075	1.18	0.021*	0.0116	1.84
dispersed	0.041***	0.0129	3.16	0.029***	0.0119	2.41	0.025	0.0161	1.53
multiple sales	-0.004**	0.0020	-1.87	-0.004*	0.0020	-1.91	-0.004*	0.0021	-1.79
size	-0.002***	0.0007	-2.34	-0.002***	0.0008	-2.31	-0.002***	0.0007	-2.36
B/M ratio	-0.663	0.9080	-0.73	-0.394	0.9034	-0.44	-0.642	0.9248	-0.69
profitability	2.666	2.7053	0.99	2.546	2.7889	0.91	3.418	3.0420	1.12
leverage	0.527	0.4408	1.19	0.448	0.4407	1.02	0.315	0.4506	0.70
year and industry dummies	yes			yes			yes		
Adj. R^2	3.32%			2.79%			3.03%		
F	1.94***			1.61**			1.62**		
number of observations	1681			1681			1681		

Table VII: Summary of findings

Directors' share dealings	**Purchases**		**Sales**	
	Expected announcement effect	Result	Expected announcement effect	Result
H1. a/b. Announcement effect	positive	positive	negative	negative
H1c. |purchase effect |>| sales effect|	yes	yes	yes	yes
H2. Information hierarchy	more strongly positive for executives	not upheld	more strongly negative for executives	not upheld
H3. Former directors announcement effect	strongly positive	strongly positive	no effect	no effect
H4. Monitoring outsider blockholders (bridging the information asymmetry gap	less positive	less positive	less negative	not upheld
H5. Presence of financial institutions	more positive	more positive	more negative	more negative
H6a. Director entrenchment	less positive	less positive	less negative	less negative
H6b. Director entrenchment with presence of outside shareholders	positive or no effect	no effect	negative or no effect	no effect
H7. Poor performance / financial distress	very strongly positive	very strongly positive	very strongly negative	very strongly negative
H8. Poor performance with outside blockholders	even stronger than in H7	not upheld	---	---
Other findings (control variables)				
with multiple transactions	more strongly positive	more strongly positive	more strongly negative	more strongly negative
with larger transaction size	more strongly positive	no effect	more strongly negative	no effect
with smaller corporate size	more strongly positive	no effect	more strongly negative	more strongly negative

Table VIII: Frequency of each type of news announcement and frequency of items per source.

This table shows the number of news announcements by category and by year. CEO stands for a change in CEO; NED is the departure or appointment of non-executive director; DIR represents the replacement of an executive director (excluding the CEO); ADV stands for a change in the firm's corporate advisors (auditors, solicitors etc.). ACQ stands for an announcement related to an acquisition, joint venture or merger; DISP represents a major disposal of part of business or important assets. OSB is the announcement of a share repurchase; CAP is a change in equity capital (seasoned equity offerings, stock split). NME is a name change; OTL is a forward-looking statement on the company's performance. BUS a business event containing any news piece that is deemed to be price sensitive but not included in any of the preceding categories. PLM stands for preliminary corporate results, 1st quarter results, interim results or 3rd quarter results. ARP and ANN refer to information from annual reports or company announcement, respectively. RNS indicates that information was used from the Regulatory News Service.

	1995	1996	1997	1998
Panel A: Occurrence of news items by type of information content				
Changes to the board / advisers				
CEO	68	80	117	143
NED (non-exec director)	229	327	408	503
DIR (executive director)	293	430	641	669
ADV (advisors)	27	38	66	84
Corporate / Equity restructuring				
ACQ (acquisitions)	228	391	618	870
DISP (asset disposals)	54	84	227	224
CAP and OSB (equity capital change and own shares buyback)	47	107	243	449
Change in prospects / other				
NME (name change)	16	9	37	40
OTL (outlook)	1123	1303	1404	1461
BUS (business event)	111	282	751	936
Panel B: Sources of news items				
Information issued by the company and analysis of this information (in press articles, interviews of management, brokerage reports and etc.)				
PLM (preliminary results)	625	732	858	1039
ARP (annual report)	475	535	554	546
ANN (co. announcement)	11	33	60	62
Information issued to comply to corporate law and regulations				
RNS (regulatory news)	1085	1751	3040	3732
Total number of news items	2196	3051	4512	5379

Table IX : Market reaction to directors' purchases and ownership structure: cross-sectional regression results

All independent variables are defined in tables III, V and VIII.
***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Panel A Dep. var. = CAAR(0,1)	**Model 4 (news release 2 days prior to purchase)**		**Model 4(news release 7 days prior to purchase)**		**Model 4 (news release 30 days prior to purchase)**	
	coef.	**t-stat.**	**coef.**	**t-stat.**	**coef.**	**t-stat.**
constant	0.06924**	2.36	0.06795**	2.30	0.07114***	2.41
other top executives	0.01514	1.20	0.01524	1.20	0.01275	1.01
chairmen	0.00209	0.27	0.00332	0.42	0.00327	0.41
other incumbent directors	-0.00782	-0.93	-0.00831	-0.98	-0.00844	-0.99
former directors	0.01516	1.24	0.01603	1.32	0.01823	1.49
concentrated blockholder						
corporations	-0.02793***	-2.58	-0.02789***	-2.57	-0.02837***	-2.57
institutional investors	0.00592	0.99	0.00630	1.03	0.00723	1.17
individuals / families	-0.01550*	-1.77	-0.01472*	-1.69	-0.01674*	-1.89
directors	-0.01120*	-1.85	-0.01129*	-1.87	-0.01111*	-1.80
News related to the items below and released 2, 7 or 30 days prior to directors' trades						
News on CEOs	-0.10194	-1.33	-0.113511	-1.41	-0.05804**	-1.98
News on exec.dir.	0.00203	0.05	0.00121	0.03	0.00140	0.08
News on non-exec. Dir	0.02782	0.74	0.01324	0.60	0.01150	0.87
News on mergers and acquisitions	-0.05962	-1.48	-0.04100**	-2.26	-0.03526***	-3.04
News on disposals	0.00636	0.15	-0.01572	-0.42	-0.02431	-1.05
News on capital changes	0.00422	0.11	-0.00567	-0.32	-0.01154	-0.91
News on business development	-0.07178	-1.64	-0.03438	-1.35	-0.01615	-0.95
News on equity buy backs	-0.01530	-1.32	-0.01480	-1.28	-0.01806*	-1.79
News on firm's prospects	0.00750	0.53	0.00832	0.79	0.00832	1.14
Control variables						
multiple purchases	0.00545	0.46	0.00528	0.44	0.00691	0.57
transaction value	-0.00375	-1.19	-0.00355	-1.12	-0.00384	-1.23
size	-0.00052	-0.17	-0.00070	-0.22	-0.00086	-0.27
B/M ratio	-2.50570	-1.03	-2.57373	-1.06	-2.64869	-1.12
profitability	1.73292***	2.32	1.78035**	2.36	1.88242***	2.47
leverage	0.00345	0.72	0.00373	0.80	0.00420	0.88
year and industry dummies	Yes		Yes		Yes	
Adj. R^2	5.81%		5.19%		5.31%	
P-value of F-test	0.00		0.00		0.00	
number of observations	873		873		873	