Directors' Share Dealings and Company Financial Performance

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Abstract. This paper examines the response of security prices to the share dealings by directors of small capitalised firms in the United Kingdom and tests as to whether the share dealings contain information with regard to the firm's future financial performance. The results of the study indicate that investors respond positively to the information signals of directors' equity purchases. We find little evidence to suggest that directors' equity sales possess significant information content. The results suggest that there is a positive association between financial performance and the type of trade directors engage in.

Key words: directors, excess returns, financial performance, financial variables

1. Introduction

The purpose of this study is to investigate the relationship between the share dealings of directors in their firms and their respective firm's future performance. Specifically we wish to explore two issues. First, how does the capital market react to the announcement that a director has purchased (sold) shares in his/her company? Secondly, does the purchase (sale) have any information content with regard to the firm's future profitability? Company directors are insiders and therefore any trading by them fall under the highly debatable issue of regulation of insider dealings. This study therefore has some implications for the insider dealings regulation/deregulation debate. While advocates of insider trading regulation base their arguments on fairness issues, opponents typically premise their arguments on the claims that insider trading promotes market efficiency and provide the mechanism to compensate managers for their efforts, Bainbridge (1999). Any closure of the debate will require some empirical evidence supporting or rejecting insider dealing regulation. This study contributes to the debate by providing some evidence on economic effects, if any, relating to insider dealings by investigating the price effects of insider dealings of U.K. small capitalised stocks.

Because the evidence on the price effects of insider trading is mixed, we focus our study on small capitalised U.K firms. If all the information about a firm were available, the market could provide a 'fundamental' value for that firm. Whilst legislation and exchange listing rules require firms to disclose information, they are not required to divulge all material information. When an insider trades the shares of his/her firm, the motive behind the trade can only be alluded to. In general, insiders trade either for liquidity reasons or because they are privy to material non-public information. If an insider trades for liquidity reasons, then no market reaction to such transactions would be expected in the context of an efficient market. However, if the trade is based on inside information, then the insider may wish to earn short-term profits or may wish to provide a signal with regard to firm value. Even though there has been increased regulation in most countries, Seyhun (1992) provides U.S.A. evidence that insider trading volume has increased and that the abnormal profits from such trading have increased as well. Seyhun (1992, p. 149) states: 'insider trading erodes public confidence in capital markets, raises firms' cost of capital, and makes it more difficult to finance worthwhile projects'. Therefore, the issue of insider trading is important for market regulators who may wish to identify cases of illegal insider trading, analysts who may use the insiders' trade to infer firm value, and the investing public who will benefit from more accurate values of the firm.

In general, prior studies suggest that insiders do earn abnormal profits. However, these studies are largely based on large capitalised firms. The issue of whether insiders of small capitalised firms also earn abnormal returns on their trades is unresolved. This study seeks to provide further evidence of this issue whilst exploring the signalling issue associated with the trade. The firms in this study comprise those listed on the London Stock Exchange in the Small Capitalised Index that have data on directors' share dealings from January 1994 to October 1997. The directors' share dealings that we analyse are the open market transactions of directors. In the context of this study, we hypothesise that these transactions only are driven by the director's inside knowledge and are therefore providing a signal about the firm's future.

This study is important for a number of reasons. Firstly, the informational effects of directors' share dealings of small capitalised firms may be different from large capitalised firms. Directors in small firms may be the founders of such firms and may still have a substantial shareholding compared to the directors of large firms. Secondly, Zeghal (1984) argues that investors scrutiny is a function of firm size, therefore, small firms may not be as actively followed by analysts as large ones. Any informational effects of directors' trade may therefore be larger. Thirdly, little evidence exists regarding the share price response of share dealings by directors of small capitalised firms. Consequently, this study makes a very important contribution to the extant literature on directors' share dealings. Lastly, the study contributes to the insider trading regulation/deregulation debate by

providing some evidence regarding the economic effects, if any, of insider trading in small capitalised stocks.

In the following section, we review the debate on regulation/deregulation of insider dealings and provide some discussion of U.K. regulation of directors' share. This is followed by a discussion of the extant literature on insider trading. In the next section we develop our hypotheses with regard to insider trading in small firms and future company profitability. A description of the sample selection procedures and the methodology employed ensues. We then present our results and conclusions.

2. Argument For and Against Insider Trading

It can be argued that insider dealing regulation is one way society allocates the property rights to information produced by a firm. In recent times in the U.K, and in most other countries, common law does not permit insiders to trade in a firm's securities without disclosure of inside information. Those who support deregulation of insider trading argue that it contributes to market efficiency by encouraging the flow of information unto the market which facilitates the price formation process Manne (1966a). Prohibition, therefore, in the view of supporters of deregulation, lacks any rational economic arguments. Supporters of regulation of insider trading typically respond either by rejecting the claim that efficiency is the controlling criterion or by attempting to show that the prohibition is justifiable on efficiency grounds.

Manne identified two principal ways in which insider trading benefits society and/or the firm in whose stock the insider traded. First, he argued that insider trading causes the market price of the affected security to move toward the price that the security would command if the inside information were publicly available. In effect, both society and the firm benefit through increased price accuracy. Secondly, he suggested that insider trading is an efficient way of compensating managers for producing information. Although most developed market economies securities laws encourage accurate pricing by requiring disclosure of corporate information, they do not require the disclosure of material information which may put the firm at a competitive disadvantage. When a firm, therefore, lawfully withholds material information, its securities are no longer accurately priced by the market.

Manne essentially argued that insider trading is an effective compromise between the need for preserving incentives to produce information and the need for maintaining accurate securities prices. Insider trading, therefore, acts as a replacement for public disclosure of the information, preserving market gains of correct pricing while permitting the corporation to retain the benefits of nondisclosure, Manne (1966a, pp. 80–90). Insiders' profits are the price society have to pay for obtaining the beneficial effects of enhanced market efficiency. Manne

(1966a, pp. 116–119) asserted that insider trading is an effective way to compensate corporate agents for innovations. The entrepreneur can recover the value of his discovery through buying the firm's securities prior to disclosure and selling them after the price rises. Carlton and Fischel (1983) suggest that by trading on new information, the agent self-tailors his compensation to account for the information he produces, increasing his incentive to develop valuable innovations. A criticism of the compensation theory is that it is limited by one's wealth and therefore the number of shares the insider can purchase depends on his/her wealth rather than the insiders contribution to the information produced. It is also difficult to restrict trading to those who produced the information. Where information is concerned, production costs normally exceed distribution costs. As such, many firm agents may trade on the information without having contributed to its production.

A related objection is that if managers are allowed to profit from inside trading it reduces the penalties associated with a project's failure since managers can sell their shares before information becomes public and thus avoid an otherwise certain loss. Managers can also go beyond mere loss avoidance into actual profitmaking by short selling the firm's stock.

Haddock and Macey (1987), Macey (1991) argue that insider trading prohibition is supported and driven in large part by market professionals. These professionals base their arguments on insiders breach of fiduciary duty. A ban on insider trading lowers the risks faced by specialists and market-makers and some portion of the resulting gains could be passed on to professional traders in the form of narrower bid-ask spreads. Haddock and Macey suggest that analysts and traders benefit further by a prohibition on insider trading, because only insiders are likely to have systematic advantages over market professionals in the competition to be the first to act on new information.

According to Banbridge (1999) supporters of insider trading regulation argue that: (1) insider trading harms investors and thus undermines investor confidence in the securities markets; (2) insider trading harms the issuer of the affected securities; and (3) insider trading amounts to theft of property belonging to the corporation and therefore should be prohibited even in the absence of harm to investors or the firm. He rejects the first argument on the grounds that an insider's trading gain corresponding to shareholder's 'loss' (if the insider buys securities from shareholder prior to information disclosure) is reaped not just by inside traders, but by all contemporaneous purchasers whether they had access to the undisclosed information or not. He argues further that information asymmetry between insiders and public investors arises out of disclosure rules that allow corporate nondisclosure of material information and not to insider trading per se. Macey (1991, p. 44) argues that Japan only recently began regulating insider trading and its rules are not enforced. The same appears to be true of India and points out that Hong Kong

has repealed its insider trading prohibition yet both have vigorous and highly liquid stock markets.

Regulationists argue further that even if insider trading probably only rarely causes the firm to loose opportunities, it may create incentives for management to alter firm plans in less drastic ways to increase the likelihood and magnitude of trading profits. For example, trading managers can accelerate receipt of revenue, change depreciation strategy, or alter dividend payments in an attempt to affect share prices and insider returns, Brudney (1979). Levmore (1982, p. 149) suggests that insider trading may result in allocative inefficiency by encouraging over-investment in those industries or activities that generate opportunities for insider trading. Easterbrook (1981, p. 332) suggest that due to insider trading managers may elect to follow policies that increase fluctuations in the price of the firm's stock by selecting riskier projects. Carlton and Fischel (1983) reject Easterbrook's suggestion and argue that because managers work in teams, the ability of one or a few managers to select high-risk projects is severely constrained through monitoring by colleagues. Cooperation by enough managers to pursue such projects to the firm's detriment is unlikely because a lone whistle-blower is likely to gain more by exposing others than he will by colluding with them. Carlton and Fischel alternatively argue that even if insider trading creates incentives for management to choose high-risk projects such incentives would act as a counterweight to the inherent risk aversion that otherwise encourages managers to select lower risk projects than shareholders would prefer.

Bainbridge (1986), Easterbrook (1981) and Macey (1991) argue that insider trading is not unfair to investors in any meaningful sense of the term. The principal problem is the difficulty investors have in distinguishing those firms in which insider trading is frequent from those in which it is infrequent. If they are unable to do so, individual firms are unlikely to suffer a serious reputational injury in the absence of a truly major scandal. Baingridge (1999) rejects the corporation property rights to information argument for prohibiting insider trading with the argument that insider trading does not affect an idea's value to a corporation. He suggests that legalizing insider trading would have a much smaller impact on the corporation's incentive to develop new information than would, say, legalizing patent infringement. It does not appear from the literature that insider dealing regulation/deregulation debate has reached a theoretical closure. There is therefore the need for more evidence that bear on the debate and this current study contributes to that.

3. Directors' Share Dealings and Share Prices

Prior U.K. studies on insider trading seem to suggest that insiders can earn significant positive abnormal returns by trading their own firm's securities (see King and Roell, 1999; Pope et al., 1990; Gregory et al., 1994; Gregory et al., 1997).

Results from the initial studies provide conflicting evidence. Significantly, Gregory et al. (1994) report significant Cumulative Abnormal Returns for small and medium sized companies. Gregory et al. (1997) sought to reconcile the differences in the evidence by using a comprehensive data set. They report that significant abnormal returns can be earned if the appropriate trading strategy, based on the directors' trades, is followed.

The seminal U.S.A. paper by Jaffe (1974) provides evidence that insiders' purchases (sales) take place after abnormal share price decreases (increases). Thus insiders are able to time their trades. Nunn et al. (1983) hypothesised the existence of an information hierarchy. They find that the performance of trades by chairmen and directors outperforms those made by other corporate insiders such as officers and substantial shareholders. Seyhun (1986) and Lin and Howe (1990) corroborate these findings. Seyhun (1986) examines U.S. insider trading data between 1975 and 1981. His evidence indicates that insiders can predict future stock price changes, that the expected loss to insiders and firm size are negatively correlated and this is reflected in larger bid-ask spread for small firms. Seyhun states that the most profitable insider trading occurs in small firms. Lakonishok and Lee (2001) investigate the ability of insiders to time the market and the usefulness of insider trading in predicting cross-sectional variation in stock returns and suggest that whilst insiders may sell for many reasons, they buy to make money. In this respect, they find that only insider purchases are useful. They also find that the utility of insider trading is not consistent across the market capitalised groups. Their results suggest that insider trading is a stronger indicator in small capitalised stocks and that when insiders buy these stocks, 'insiders know what they are doing' (p. 109). If insiders earn abnormal returns and Manne (1966a) analysis is correct, it suggests a relationship between insider trading and the financial performance of firms. This paper seeks to extend the debate by exploring the potential link between insider trading and future firm performance.

4. Financial Performance and Directors' Share Dealings

It may be argued, therefore, that any share dealings of directors in their own company's shares may be due to the hope of future gain or avoidance of future loss. Directors' share dealings may therefore be related to future company performance. Directors' purchases may indicate future confidence in their companies, which may have positive price implications. If directors have negative perceptions about the future, it is unlikely that they will commit funds into acquiring more shares in their firms. In this study, we hypothesize that directors' share purchases may have a positive impact on the firm's share price on the day that such announcements are made public since it may provide a positive signal about future company profitability and hence positive future cashflows.[1] Similarly, it can be argued that divestments by directors may indicate lack of confidence in the future and hence

share sales might have a negative impact on the firms' share price. Directors may sell for liquidity rather than information reasons. If directors sell for information reasons, it means that the sale is based on information which when made public, can affect the value of the firm negatively e.g. shrinking sales, trading difficulties etc. If directors sell for liquidity reason, is may be due to personal cash requirements which may have nothing to do with company performance. However, if sales are for liquidity reasons, it may only have a short-term impact on prices. In the short term, it may depress prices if the sales are significantly large and the shares are not liquid enough. Since this study is being carried out in the context of semi-strong form market efficiency, we hypothesize that if directors' divest for informational reasons, then, such sales will have some relationship with future company financial performance. We define financial performance narrowly as company profitability. The aim of this study, therefore, is to examine the information content, if any, associated with directors' acquisitions and divestments and its relationship with future company financial performance.

5. Sample Selection and Methodology

5.1. DATA

The sample of firms in this study is made up of firms listed on the London Stock Exchange in the Small Capitalised Index that have data on directors' share dealings from January 1994 to October 1997. Data is available in Extel on directors' share dealings from January 1994 which puts a limit on the starting date for the current study. To be included in the final sample, an event has to satisfy two sets of criteria; the first set is used to identify those directors' share transactions which may contain information and the second set is used to exclude events that may affect the study in the test period but which is not of direct interest.

In applying the first set of criteria, the following directors' share transactions are deleted from the study:
 1. Share bonus entitlement
 2. Shares held on appointment
 3. Purchase via equity participation plan
 4. Rights Issue
 5. Conversion of warrants
 6. Gift to spouse or other family member
 7. Transfers to PEP, spouse or other family member
 8. Exercise of options on shares
 9. 'Bed and breakfast' transactions
10. 'Mixed Signal' transactions.

Transactions 1–5 are usually initiated by the company rather than the director and thus convey no information about the director's beliefs about the future fortunes of the company. Transactions 6 and 7 may act as proxies for a director's belief

about his company's future, but that is all they are proxies. A 'Bed and breakfast' transaction is whereby a director sells and immediately repurchases shares as a means of minimising tax liability. Such a transaction conveys no information and is therefore excluded. Similarly, whilst the exercise of options will depend on a director's confidence in the company, it is excluded from the sample because of the bargain prices generally associated with these transactions. As stated earlier, in the context of this study, we believe that only open market transactions contain information. Because the director is paying the market price, we believe that this is a stronger signal of director's confidence than the exercise of an option. 'Mixed Signal' transactions are situations whereby one director buys and another director sells in the same month. If we hypothesise that an open market purchase (sale) is an indicator of a director's confidence (lack of confidence) in the firm, then by including firms that convey conflicting signals in the same month (open market purchase and sales) merely taints the data and may possibly impact on the results. Thus such transactions are excluded from the study because it is difficult to assess the information content of the signal.

An event that satisfies the above criteria has then to satisfy a second set of criteria. These are:

1. There must not be any major news announcement during the twenty one day period surrounding the announcement of sales or purchases by directors. Examples of such announcements include earnings and/or dividend announcements, management forecasts, expansions and acquisitions, share dividend, share split, litigation, board changes, major share holdings, etc. This ensures that other news worthy events that could affect the results of the study in the immediate period surrounding the purchase or sales of shares by directors' are excluded.

2. Daily share price as well as financial data must be available in Datastream to enable the parameters of models used in the study to be estimated.

Only those observations that satisfied both sets of criteria were selected for the study. The final sample consisted of 132 buy and 89 sell transactions.

5.2. METHODOLOGY

The methodology employed in this study is essentially a variance methodology which has been used in a number of previous studies [see Beaver (1968), May (1971), Patell (1976) and Opong (1995) among others]. Each firm is analysed in two time periods namely (1) non directors' share dealings period, or estimation period followed by (2) directors' share dealing period, or test period. The estimation period covers a period 139 days up to the day before the public release of directors' share dealings information. The report period starts from ten trading days before the public announcement of directors' share dealings through to ten days subsequent to the share dealings date. Time period zero is the day of the public

announcement. Normal daily returns were generated using the standard market model. The market model is given by:

$$y_{it} = \alpha_i + \beta_i X_{it} + u_{it}, \quad i = 1, \ldots N, \quad t = 1, \ldots, T \tag{1}$$

where

y_{it}: is the continuously compounded daily returns of firm i at time period t,

x_{it}: is the continuously daily returns on the Financial Times All Share Index at time period t,

u_{it}: is abnormal return of firm i in time period t which is assumed to be zero and α, and β_i are the security specific intercept and slope coefficients.

By their nature, smallcap firms may be subject to the problems that arise due to non-synchronous trading which becomes amplified the shorter the differencing interval in the calculation returns and the more infrequently securities are traded. Two procedures for overcoming these problems are adopted, Scholes and Williams (1977) and Fowler and Rorke (1983). Actual returns were subtracted from the corresponding normal returns to obtain excess returns according the following:

$$\hat{u}_{i\tau} = y_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i x_{i\tau}, \quad i = 1, \ldots, N, \quad \tau = T + 1, \ldots, T + m \tag{2}$$

where $y_{i\tau}$ is actual return of firm i in period τ and $\hat{\alpha}_i$ and $\hat{\beta}_i$ are estimates from equation (1) $x_{i\tau}$ and is the return on the Financial Times All Share Index for time period τ.

It is further assumed that the beta estimates are stable over time and that the effect of any instability on the study will be negligible.[2] One significant anomaly relating to the security return generating process is the tendency of small capitalised stocks to outperform larger ones. Event study methodologies therefore should consider whether an appropriate adjustment for firm size needs to be made. However, Dimson and Marsh (1986) present evidence that where the measurement interval is short, the impact of size on event study methodology is not significant. In the current study the measurement interval is 21 days around the release of directors share dealings. However, since the sample is made up only of small capitalised stocks, the potential problem of size can be ignored. Daily excess returns were averaged across the observations according to

$$AR_\tau = N^{-1} \sum_{i=1}^{N} \hat{u}_{i\tau}, \quad \tau = T + 1, \ldots, T + m \tag{3}$$

where AR_τ is the average across observations for a particular day τ, and $u_{i,\tau}$ is the excess returns for firm i for day τ. To test the hypothesis:

$H_0 : AR\tau = 0$ for all τ

versus

H$_1$: $AR\tau \neq 0$ for some τ

We use the statistic:

$$t_{AR} = \frac{AR_\tau}{S_{e_{i,t}}} \tag{4}$$

where $S_{e_{i,t}} = [\text{var } (AR_t)]^2$ with var estimated over the 129 days, $T = 1$ to $T = 129$.

The abnormal returns over the test period ($AR\vartheta$) are used to investigate the information content of directors' share dealings. For the purpose of this study it is assumed that if directors' share dealings contains no unexpected information, abnormal returns will be zero. Rejection of the null hypothesis would indicate that the directors' trades contain information that alters expectations concerning future cash flows. The release of such information will cause a change in investors' estimate of the probability distribution of the firm's future share price leading to a change in the current price. We test the significance of the cumulative abnormal returns using the ZD test reported in Hamill et al. (2002). It provides a robust variance estimate which simultaneously accounts for multiple mis-specification of the market model.

The relationship between financial performance, directors' share dealings and company value is examined using the binary regression model. We hypothesise that directors' purchases signal future good news which should be reflected in the company's performance at a later date. Thus, there should be a positive relationship between directors' purchases and future profitability denoted by earnings per share and vice versa. A simple earnings per share forecast model that assumes no change earnings per share from one annual period to the other is assumed. Thus, expected earnings per share is given by

$$E(Eps_{i,t})^3 = Eps_{i,t-1} \tag{5}$$

where $E(Eps_{i,t})$ is the expected earnings per share in year t for firm i and $Eps_{i,t-1}$ is the previous year's earnings per share.

The changes in earnings per share is scaled down by their expected values given by:

$$Epssurp_t = (Eps_{i,t} - Eps_{i,t-1})/Eps_{i,t-1} \tag{6}$$

where $Epssurp_t$ is the surprise in financial performance that is conveyed to the market.

The impact of financial performance on company value following the purchase or sale by company directors is investigated using the binary logistic model[4] defined by:

$$g(\pi_j) = \beta_0 + x_j\beta \tag{7}$$

where:

π_j = the probability of a response for financial performance
$g(\pi_j)$ = the logit link function given below
β_0 = the intercept
x_j = a vector of predictor variables ie abnormal returns and purchase/sale of shares by directors
β = a vector of unknown coefficients associated with the predictors

The logit link function with its corresponding distribution is given as:

$$g(\pi_j) = \log_e(\log_e(\pi_j/1 - \pi_j)) \sim 0, \pi^2/3.$$

Performance is denoted as positive and assigned a value of 1 in the regression response equation if a change in performance in the period is positive and zero otherwise. An advantage of the logistic model is that it provides an estimate of the odds ratio for the model. The odds ratio equals 1 when no association exists. The ratio is the odds that a positive performance will induce directors to purchase shares.

6. Empirical Results

6.1. INFORMATION CONTENT

The results of the information content study, for directors' equity purchases, are reported in Tables I–V. Table I provides some information on the sample sued in the study. The mean value of sampled firms involved in directors' equity purchases was £129.7 million and that for directors' equity sales was £110.3 million. Most sampled firms values were greater than £50 million but less than £500 million. Table II shows the mean excess returns for directors' transaction. The results indicate that excess returns on the announcement day for directors equity purchases is not statistically significant by which ever method is used to compute beta. A notable feature of excess returns in Table II is that the days prior to the directors' equity purchases are dominated by negative excess returns Likewise, the days following directors' equity purchases, are dominated by positive returns. The highest mean excess returns in absolute terms occurred on the day prior to an announcement of equity purchase. Excess returns on the day prior to directors' buy transactions is statistically significant at the 1% level and is positive. This could be due to the market anticipating the information signals contained in the purchase prior to its public release or it could be due to seepage of information to the market regarding the sale. Lakonishok and Lee (2001) find a similar result for directors purchasing shares in small firms. It is also noteworthy that the only other significant excess returns in the test period subsequent to directors' purchase which was computed based on Scholes-Williams procedure is also positive. Excess returns computed using beta estimates from Fowler & Rorke methodology is also

Table I. Market value statistic for sampled firms

Market value in (£m)	Director' purchases	Directors' sales
< 50	38	25
> 50 < 100	44	24
> 100 < 500	41	37
> 500	9	3
n	132	89
Mean	129.7 (£m)	110.3 (£m)
Truncated Mean	104.6 (£m)	97.4 (£m)
Median	81.4 (£m)	84.9 (£m)
Std Deviation	155.9 (£m)	99.4 (£m)
Minimum	1.2 (£m)	4.1 (£m)
Maximum	846.7 (£m)	547.4 (£m)
Q1	43.8	43.8
Q3	145.55	145.55

statistically significant for day -1. The preponderance of positive values in the post announcement period suggest that directors' equity purchases appear to have a positive impact on the price of the sampled firms. With regard to equity sales reported in Table II, the highest mean excess return in absolute terms occurred on the day of the public announcement. None of the mean excess returns are statistically significant using either Scholes & Williams beta estimate or Fowler & Rorke beta estimate. The results reported in this study suggest that directors' equity disposals do not convey any significant information to the market. The results do not support our earlier hypothesis that divestments by directors in their own firms will have a negative impact on the value of those firms. The behaviour of cumulative excess returns reported in Figure 1 suggest that divestments by directors' of small capitalised firms do appear to have a small negative impact on the value of those firms. Figure 1 also suggests that if someone had purchased a portfolio of firms comprising of announcements of directors' equity purchases in the period studied, an excess returns of less than 1% could have been earned between the announcement day and ten days subsequent to the announcement. The results from this study shows that directors' stock purchases is a significant positive economic event. The results for directors' equity sales could have been affected by our inability to separate observations into sales that are made for information reasons and those made for liquidity reasons. Such a separation can only be made if one knows the motives behind directors' sales. The results reported in this paper for directors' equity purchases does support the initial findings of Gregory et al. (1994) among others who find directors' trading to be profitable in the U.K and
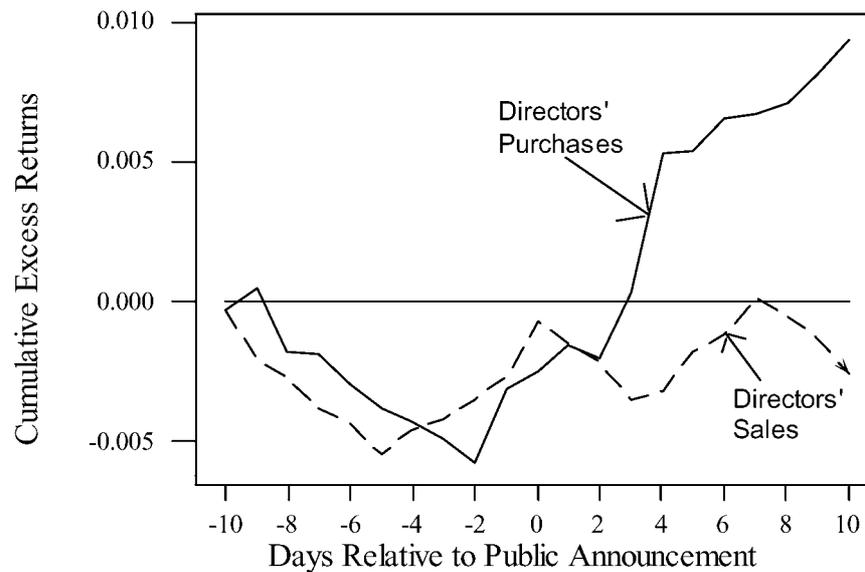
Figure 1. Cumulative excess returns for directors' purchases and sales.

other studies elsewhere (see Jaffe (1974), Finnerty (1976) Givoly and Palmon (1985) Seyhun (1986), Lin and Howe (1990) and Jeng et al. (1999) among others). However, the nature of our sample which is restricted to small capitalised firms may not make the current study directly comparable to previous U.K. studies.[5] The nature of the sample is such that equities are closely held by family units of original founders who may have sentimental attachment to their companies and may therefore not sell in a manner which could lead to dilution or relinquishment of the control of these companies. Equity sales by directors in small capitalised firms in U.K. may therefore be due largely to liquidity rather than information reason and this may explain the lack of any significant market reaction to equity sales.

Table III presents the results of cumulative excess returns and significance tests based on the ZD test. The results indicate that abnormal returns are statistically significant on the day prior to the announcement of directors' equity purchases. This indicates that directors' purchases affect equity values positively on the day prior to the purchase being made public. Figure 1 shows that directors' equity purchases do indeed impact positively on the value of sampled firms while equity sales by directors appear to have a small negative impact on sampled firms.

Table III indicate that for equity purchases, all the values reported are statistically significant except the holding period –1 to 2. However, for equity sales, none of the values reported is statistically significant.

Table II. Mean excess returns for Directors' equity dealings ($N = 132$)

Day	Directors' purchases		Directors' sales	
	Mean excess return based on Scholes & Williams beta estimate	Mean excess return based on Fowler & Rorke beta estimate	Mean excess return based on Scholes & Williams beta estimate	Mean excess return based on Fowler & Rorke beta estimate
−10	−0.0003	−0.0004	−0.0003	−0.0004
−9	0.0008	0.0010	−0.0017	−0.0020
−8	−0.0023*	−0.0024*	−0.0008	−0.0007
−7	−0.0001	−0.0001	−0.0010	−0.0010
−6	−0.0011	−0.0011	−0.0006	−0.0004
−5	−0.0008	−0.0009	−0.0011	−0.0010
−4	−0.0005	−0.0006	0.0009	0.0009
−3	−0.0006	−0.0006	0.0004	0.0005
−2	−0.0009	−0.0011	0.0007	0.0005
−1	0.0027**	0.0026*	0.0008	0.0007
0	0.0006	0.0004	0.0020	0.0018
1	0.0009	0.0008	−0.0008	−0.0008
2	−0.0004	−0.0005	−0.0007	−0.0006
3	0.0023*	0.0021	−0.0013	−0.0011
4	0.0005	0.0008	0.0003	0.0004
5	0.0001	0.0002	0.0014	0.0015
6	0.0012	0.0012	0.0006	0.0009
7	0.0001	0.0002	0.0013	0.0017
8	0.0004	0.0005	−0.0006	−0.0004
9	0.0010	0.0007	−0.0008	−0.0005
10	0.0013	0.0014	−0.0013	−0.0011

**Significant at the 0.01 level.
*Significant at the 0.05 level.
Notes: Day is the day around public notification of Directors equity purchases/sales, Day 0, is the day of public notification.

6.2. INFORMATION CONTENT AND FUTURE FIRM PERFORMANCE

Results for the binary logistic regression is reported in Table IV. The binary logistic regression investigates the relationship between the abnormal return observed from the directors' signal (purchase/or sale) and the firm's future financial performance. Performance is denoted as positive and assigned a value of 1 in the regression equation if a change in performance in the period is positive and zero otherwise.

The two performance response categories produced 141 positive observations and 28 negative categories for the sample the consisted of directors sales and purchases. The logistic regression response value designated as the reference event

Table III. Cumulative abnormal returns from days –1 to 10 for directors equity dealings

Holding period	Purchases	p-value	Sales	p-value
−1:0	0.0033	0.023*	0.0028	0.066
−1:1	0.0042	0.021*	0.0020	0.196
−1:2	0.0037	0.060	0.0013	0.320
−1:3	0.0060	0.013*	−0.0001	0.999
−1:4	0.0066	0.014*	0.0003	0.461
−1:5	0.0066	0.021*	0.0016	0.328
−1:6	0.0078	0.014*	0.0023	0.287
−1:7	0.0078	0.019*	0.0036	0.199
−1:8	0.0083	0.020*	0.0030	0.252
−1:9	0.0093	0.015*	0.0022	0.316
−1:10	0.0106	0.010*	0.0009	0.420

*Significant at 0.01 level.

is the positive performance which is the first entry under value in the response information panel. The logistic regression Panel shows the estimated coefficients (parameter estimates), standard error of the coefficients, z-values, p-values, odds ratio and a 95% confidence interval for the odds ratio.

From Table IV, one can see that abnormal returns ($z = 0.02$, $p = 0.986$) have p-value greater than 0.05, indicating that there is sufficient evidence that the parameters are zero using a significance level of $a = 0.05$. This indicates that there is a weak relationship between directors' trading and future corporate performance. However, the p-value for the type of trading that takes place, i.e. buy/sell, is statistically significant at 0.05 level. The positive coefficient for trading type indicates that there is a positive association between financial performance and the type of trade directors engage in. The odds ratio provides the odds of buying given positive financial performance divided by the odds buying given a negative performance. The odds ratio equals 1 when no association exists. This is the case for the relationship between abnormal returns and financial performance since the ratio is very close to 1. The odds ratio indicates that the odds for directors buying shares in their own firm given a reported positive financial performance is 2.5 times that for selling.

Next, the last Log-Likelihood from the maximum likelihood iterations is displayed along with the statistic G. This statistic tests the null hypothesis that all the coefficients associated with predictors equal zero versus these coefficients not all being equal to zero. In this case, $G = 4.473$, with a p-value of 0.107, indicating that there is insufficient evidence to claim that the model does not fit the data adequately. If the p-value is less than the specified level of significance (in this case 0.05) we would reject the null hypothesis of an adequate fit.

Table IV. Binary logistic regression: performance versus abnormal returns and directors trading type

Response information:

Variable	Value	Count
Performance	Positive	141 (Event)
	Negative	28
	Total	169

Factor information:

Factor	Levels	Values
Trading type	2	buy sell

Logistic regression table:

Predictor	Coef	SE Coef	Z	P	Odds ratio
Constant	1.2867	0.2484	5.18	0.000	
Abnrtn	0.039	2.290	0.02	0.986	1.04
Trading type:					
sell	0.9416	0.4694	2.01	0.045	2.56
Log-likelihood	−73.640				
Test that all slopes are zero: $G = 4.473$, DF $= 2$, P-Value $= 0.107$					

Goodness-of-fit tests:

Method	Chi-square	DF	P
Pearson	168.967	166	0.421
Deviance	147.279	166	0.849
Hosmer-Lemeshow	5.993	8	0.648
Brown:			
General alternative	0.666	2	0.717
Symmetric alternative	0.003	1	0.955

Measures of Association:
(Between the response variable and predicted probabilities)

Pairs	Number	Percent	Summary measures	
Concordant	1530	38.8%	Somers' D	0.15
Discordant	922	23.4%	Goodman-Kruskal Gamma	0.25
Ties	1496	37.9%	Kendall's Tau-a	0.04
Total	3948	100.0%		

7. Conclusion

This paper examines the information content of directors' purchases and sales of equity in their own company and investigates the relationship between excess returns and future firm financial performance. The results of the study indicate that investors respond positively to the information signals of directors' equity purchases in small capitalised stocks in the U.K. We find evidence of a small negative but statistically insignificant impact on prices of directors' equity sales. Equity sales by directors in small capitalised firms in U.K. may therefore be due largely to liquidity rather than information reason and this may explain the lack of any significant market reaction to equity sales. Our results support the findings of Gregory et al. (1994). This study shows a weak positive relationship between directors' trading and future corporate performance. This result does not provide support for Manne (1966a) suggestion that insider trading provide compensation for managerial effort since we find no evidence of strong association between directors' stock purchases and corporate financial performance. However, the results of the study indicate a positive association between financial perform-ance and the type of trade directors engage in and that the odds for directors buying shares in their own firms given a reported positive financial performance is 2.5 times that for selling. Our findings would appear to support the results from previous U.K. studies; Gregory et al. (1994) but do not support the findings of U.S. studies; Seyhun (1986). However direct comparisons are difficult given the different time periods studied and the differing methodologies employed.

Company law in U.K contain provisions for securing the disclosure and regis-tration of substantial individual interests in stock capital that carry unrestricted voting rights. Shareholding by directors in small capitalised stocks will fall under these sections since in most cases, directors will be substantial shareholders. The law requires notification to the company of any acquisitions or divestitures of three percent in writing within two business days. The law also requires notification of family and corporate interests as well as members acting in a concert party. Section 142 of the Financial Services Act (1986), and Financial Services and Market Act Part V1 (2001) details rules for the admission of securities to listing on the Exchange. There are provisions in the listing rules that deals with directors continuing obligations, among which, is a model code on directors' stock dealings activities. The purpose of the Code, presumably, is to ensure that directors, certain employees and persons connected with them do not abuse, or even place them-selves under suspicion of abusing, price-sensitive information that they may have or be thought to have.

The Stock Exchange attempts to control insider trading and has published a document providing guidance on the dissemination of price-sensitive information, with the intention that all listed companies follow the same strict guidelines. It is possible that the managerial market may also penalize managers who betray their fiduciary duty to shareholders by trading on inside information. There is the need

for more studies that examine the impact of these regulations. The results reported in this study are tentative and requires further research into insiders' trading behaviour and financial performance in the U.K. when rich data becomes available in the near future. There is also the need for further study on the motives that underlie directors trade and the relationship between price and proportion of a directors holding that is sold.

Acknowledgements

Notes

[1] We assume here that company profitability has a strong positive association with cashflows.

[2] See Chandra et al. (1991); Burnett et al. (1995).

[3] This is the net profit arrived at after deducting tax, minority interest and preference dividends, but before any post-tax as reported extraordinary items, allocation to reserves other than untaxed reserves and post tax disclosed extraordinary items. Directors' bonuses are deducted if shown in the profit appropriation proposal rather than deduction from operating income and expenses. This figure is not always equal to the as reported figure for 'net income' due to directors bonuses, the allocation to untaxed reserves and the treatment of preference and preferred dividends (Item 625 in Datastream).

[4] We are very grateful to the anonymous referee for suggesting the use of logit model rather than our original multiple regression model in an earlier version of this paper.

[5] Following the suggestion of a referee, we computed excess returns using the SmallCap Index rather than the FT All Share Index and found no significant results for both directors' sales and purchases. The results are not reported for brevity and is available on request from the authors.

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