Corporate Governance and Information Efficiency in Security Markets: Results for 'Smaller Cap' Companies in the UK

by

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Abstract

This paper considers a new research topic within corporate governance; namely the impact of corporate governance variables on the stock market reaction to company specific news. This topic is important for a range of stakeholders, but especially investors, because one of the key concerns of corporations is the returns to shareholders and news (and the way it is managed) has the potential to impact on these returns.

As the market reaction to news can now, given all the advances in electronic order books and the electronic transmission of news, be almost instantaneous, the analysis of the current research question has necessitated the use of the latest developments in the market microstructure literature.

For a sample of 'smaller cap' companies in the UK, the study shows that a small group of corporate governance variables (board size, Chairman/CEO split, the presence of founding directors and directors having professional qualifications) have explanatory power in terms of the market reaction to company specific news. The results of the paper point to the analysis of the impact of governance variables on the market reaction to news being a new and complementary research agenda within corporate governance.

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1 Introduction

The purpose of this paper is to explore a new area of corporate governance research; namely, the impact of corporate governance variables on the market reaction to company specific news. This topic is important because it extends the literature of governance characteristics on firm performance to the next level; namely, do governance variables, such as board structure, ownership, etc. impact on the way the market reacts to news. This can occur both through the way different boards manage news and the way different ownership structures respond to news. This paper is the first to explore whether the board's ability (via measures of market reaction) to manage news is related to governance characteristics.

The results show for a sample of 'smaller cap' companies in the U.K. that a small group of corporate governance variables (board size, Chairman/CEO split, the presence of founding directors and directors having professional qualifications) have explanatory power in terms of the market reaction to company specific news.

The results of this paper have clear implications for future research and policy agendas. In terms of research, there is a need to explore the relationship between the market reaction to news and governance characteristics on samples of larger companies, on larger samples and on samples for different markets and time periods. If the results of this paper are shown to be robust by this further work, then there are clear policy implications. To date, stock exchange rules regarding the announcement of news and good governance practices have been largely kept separate but robust results from this new research agenda would suggest the need for a more comprehensive and 'joined up' approach to the regulation of market activities. For example, at present a director of a company can also be a director of the company's

brokers but it is easy to argue why this might be a practice which should be outlawed.

The structure of the paper is as follows. Section two reviews the relevant parts of the corporate governance literature. Section three follows with a description of data and variables (especially the construction of the information measures used to capture the market reaction to news), while section four provides results and section five offers conclusions and suggestions for further research.

2 Literature

The basic premise of this paper is that corporate governance characteristics have the potential to affect the market reaction to news. Accordingly, we focus the literature review on the appropriate parts of the disclosure and corporate governance literatures.

In terms of disclosure, accounting research has investigated why companies voluntarily disclosure information over and above that which is mandatory. Here voluntary disclosures are defined as 'disclosures in excess of requirements, representing free choices on the part of company managements to provide accounting and other information deemed relevant to the decision needs of users of their annual reports' (Meek, Roberts and Gray, 1995, p. 555)

An argument for higher levels of corporate disclosure is provided by agency theory (Jensen and Meckling, 1976) where disclosure presents managers with an opportunity to reduce the information asymmetry between themselves and owners. The incentive for managers to disclose is that they can reduce investor concerns as to whether the management is acting in the owners' interests. That is, disclosure is an opportunity for management to

convince owners that they optimising shareholder wealth.

There have been a number of empirical studies which support the above type of reasoning. Verrechia (1983) and Darrough and Stoughton (1990) both found that competition among companies affected disclosure levels. Similarly Choi (1973), Foster (1986), Diamond and Verrecchia (1992) and Lev (1992) found that voluntary disclosure reduces the cost of capital, and Botosan (1997) and Sengupta found disclosure to affect the cost of equity and debt capital, respectively. Finally, Welker (1995), Healy, Hutton and Palepu (1999) and Heflin, Shaw and Wild (2001) show that relative bid ask spreads are negatively related to overall disclosure quality.

Given that that measures of information and costs of capital have been found to be related to disclosure activities, we now consider how disclosure activities might be related to corporate governance and company characteristics. As we are exploring how market based information measures reflect the governance characteristics of companies, it is not surprising that the most relevant characteristics are concerned with boards and ownership. Board characteristics are likely to impact on how disclosure activities are managed and interpreted, and ownership characteristics have the potential to influence how the market reacts to disclosure activities.

2.1 Boards

2.1.1 Board Independence

Board independence is defined here as the ratio between executive and non-executive (fully independent) directors (see Shamser and Annuar, 1993, p.44). The Combined Code (1998) defines independent directors as having no significant financial or personal ties to the management apart from their fees and shareholdings, and no relationships or circumstances which

would affect the exercise of their independent judgment.

The contribution of non-executive (independent) directors to the board are based on two theories, agency theory and resource dependence theory; the latter of which deals with the link between firms and their external environment due to outside non-executive directors' experience and expertise (Haniffa and Cooke, 2000). One perspective is that if there are more non-executive directors on a board it will become more effective because non-executive directors are more capable of checking and monitoring managers and reducing agency problems (Fama and Jensen, 1983; Weisbach, 1988; Mak, 1996; Haniffa and Cooke, 2000); they are also influential due to their expertise, experience and success in providing access to information and ideas from outside (Kesner and Johnson, 1990; Wiersema and Bantel, 1992; Goodstein, Gautam and Boeker, 1994). In contrast, non-executive directors may lack company specific knowledge and excessive monitoring may take place as a substitute for such knowledge (Baysinger and Butler, 1985; Haniffa and Cooke, 2000).

In the case of the subject being studied here, Fama and Jensen (1983), Forker (1992) and Haniffa and Cooke (2000) argue that the more independent non-executive directors on the board, the more power they will have to force the management to release more information, enhance the information disclosed and reduce the benefits of withholding information. In support of these arguments, Chen and Jaggi (2002) found that a company with a higher proportion of independent directors on the board has a higher level of corporate disclosure.

The above arguments are summarised by the following null hypothesis:

- **$\mathbf{H}_{n1}$:** There is no relationship between the proportion of independent directors on the board and information measures.

2.1.2 Board Size

When considering board independence, board size should be taken into account as well since the number of directors can influence board activity and, potentially, disclosure activities. Because boards may be considered as a burden on corporate resources, the 'small is beautiful' perspective has gained increasing popularity. It mainly deals with two issues - the direct costs of keeping large boards of directors (financial rewards and perquisites) and the indirect costs of greater bureaucracy, less openness, slower decision making and less entrepreneurial, risk-taking, etc. Yermack (1996) studies a sample of 452 large U.S. firms between 1984 and 1991 and finds that there is an inverse relationship between board size and firm value measured as by Tobin's Q. The result is robust to numerous controls for company size, industry membership, inside stock ownership, growth opportunities, and alternative corporate governance structures. He concludes that small boards of directors are more effective. Jensen (1993) supports the idea by suggesting that larger boards lead to less candid discussion of managerial performance and greater control by the CEO. Thus, larger board size can reduce the board's ability to resist CEO control. So, a large board in a firm can make coordination, communication, and decision making more cumbersome than is the case of smaller boards.

However, Eisenberg, Sundgren and Wells (1998) argue that larger boards can consist of more outsiders, who foster more careful decision-making because they bear external reputation costs if projects fail or the firm encounters financial difficulties and their share of any upside gain is limited. In addition, according to resource dependency theory by increasing in size, boards help to link the organization to its external environment and secure critical resources, including prestige and legitimacy (Pearce and Zahra,

1992).

While the above arguments and evidence are not directly tied to disclosure, they suggest that board size can have both positive and negative effects in terms of the actions of boards and hence the second null hypothesis to be explored here is:

- **$\mathbf{H}_{n2}$:** There is no association between board size and information measures.

2.1.3 Founders

There is increasing interest (Anderson and Reeb, 2004) in the role founders have on board actions and corporate performance. Conaughy (2001) found that founder family directors have more incentives to maximize firm values than non-founder family ones. While a founder family dominated board may make decisions in favour of the founder family shareholders at the expense of public investors, there are two potential influences on disclosure activities. First, since founder family directors may well have substantial shareholdings, disclosure may not be needed to influence the buying behaviour of the shareholder base – essentially, they have access to insider information and will care less about public disclosure, (Shleifer and Vishny, 1997). Second, as substantial shareholders, they have every incentive to ensure that 'good' information is passed to the market and 'bad' information is kept back. In other words, it is possible that the proportion of founder family directors on the board has an impact on information disclosure:

- **$\mathbf{H}_{n3}$:** There is no relationship between the proportion of founder family directors on the board and information measures.

2.1.4 CEO/Chairman Split

A further aspect of the independence of boards is the split responsibility of the Chief Executive Officer (CEO) and the Chairman of the board. In the UK, due to the unitary board structure, independent board leadership is recommended with a clear division of roles between the Chairman and the CEO; with the Chairman being in charge of running the board and the CEO being responsible for running the business.

The arguments against the CEO/Chairman roles being vested in a single individual are grounded in agency theory (Jensen and Meckling, 1976). If the roles of CEO and Chairman are separated, it will provide essential checks on management performance and prevent powers from being concentrated on one potentially dominant person on the board (Rechner and Dalton, 1991; Forker, 1992). The arguments for CEO/Chairman roles being merged are based on the notion that managers are seen as acting in the interest of shareholders, so there will be no problem if the two roles are merged (Eisenhardt, 1989; Dahya, Lonie and Power, 1996; Rechner and Dalton, 1991; Donaldson and Davis, 1991)

In the case of information disclosure, the separation of the CEO and the Chairman will benefit the monitoring of management performance and increase the benefits from disclosing information (Forker, 1992). In fact, where the two roles are held by a single individual, there is evidence of a lower level of corporate disclosure (Forker, 1992, and Gul and Leung, 2002). The null hypothesis is formed as follows:

- $\mathbf{H}_{n4}$**:** There is no relationship between CEO/Chairman split and information measures.

2.2 Director Characteristics

2.2.1 Gender

For years, corporate watchdogs have pursued the notion that diverse boards are good because they are more likely to challenge management. Directors from different backgrounds – profession, industry, gender and race – are more likely to ask probing questions than are the CEO's friends and professional peers. However, in terms of race and gender, progress is still limited with board members tending to recruit other board members from their networks – it is comfortable to have people you know and trust!

We test this notion of board diversity impacting on the actions of the board, including disclosure activities, via the gender mix of the board. This leads to the following hypothesis:

- H_{n5}:There is no relationship between the board diversity and measures of information.

2.2.2 Professional Background

The Cadbury Report (1992) suggested the professional training of directors is an important issue and it is necessary for directors to undertake some forms of external training (also see Smerdon, 1998). In addition, Haniffa and Cooke (2000) argue that educational background will be an important explanatory element in information disclosure of the company. If there are more directors on the board with accounting or professional business backgrounds, they will tend to disclose more information to improve the image of the firms and the credibility of the management team. Particularly, the accounting background of a financial director will be crucial for the information released in the company's annual report. Ahmed and Nicholls (1994)

found that qualified directors receiving more professional training may disclose more information. Therefore, the null hypothesis is:

- **H_{n6}:** There is no relationship between the proportion of directors holding professional qualifications on the board and measures of information.

2.3 Ownership Characteristics

2.3.1 Shareholding of the Board of Directors

Verrecchia (2001) states that if the directors have incentives, such as beneficial shareholdings, they may tend to bias information disclosure to make it more or less favorable than truly expected. Dedman (2004) argues that if the managers whose remuneration includes the shares of the company, they may tend to release news when their companies are inaccurately valued by the market in order to increase their personal wealth. Similarly, Gray, McSweeney and Shaw (1984) point out that directors may disclose information voluntarily if it is in their own interest. If directors own the shares of the company, their interest will coincide with that of the shareholders and they will pay more attention to the share price of the company, which fully reflects the performance and prospects of the corporation. In other words, the shareholdings of the directors may have an impact on the information disclosure by the board of directors. Therefore, the null hypothesis is:

- **H_{n7}:** There is no relationship between the shareholdings of board of directors and measures of information.

2.3.2 Dominant Shareholdings

While there has been a wealth of literature on blockholding and institutional shareholdings (see Short and Keasey, 2005), in terms of current purposes there is a complementary argument to that concerning directors' shareholdings. Rather than being sensitive to disclosing information, there is in this situation likely to be a heightened sensitivity to receiving and being receptive to information disclosures because of the potential effects on wealth and the null hypothesis is as follows:

- $\mathbf{H}_{n8}$: There is no relationship between dominant shareholdings and measures of information.

2.4 Control Variables

Prior literature suggests a range of control variables including share price, return volatility, firm size, profitability, gearing and industry classification (e.g. see Hanley, Kumar and Seguin, 1993; Welker 1995; Brockman and Chung, 1999; Sarin, Shastri and Shastri, 2000; Hedge and McDermott, 2004). These control variables are defined in the next section along with dependent and independent variables.

3 Data, Variables and Descriptive Statistics

3.1 Data

As the majority of the approximately 2,000 companies listed on the London Stock Exchange (LSE) are not large, the sample chosen for this exploratory study consists of 114 randomly selected non financial companies outside of the FTSE 250 for the year 2000. While it has been the tendency of finance

research to focus on the largest companies because of data availability and quality, we feel the current sample will be more representative of the vast body of listed companies than the usual sample of very large companies. The sample of 114 firms was eventually chosen because of the amount of work involved in manually collecting the data and missing data. The corporate governance and financial accounting data are taken from the year 2000 annual accounts.

In terms of the information measurement, intraday data are used in this study. The raw intra day data (transaction, price, volume, etc.) are acquired from the LSE and news announcements for each firm are collected via the Regulatory News Services (RNS) from the LSE website. The time period of the market and news data are closely matched to the calendar time period of each firm's financial year.

3.2 Variables

The definitions and estimation of the full list of variables are described in Table 1. The different empirical models will use different sets of these variables.

Table 1

While most of the variable definitions and estimation is self explanatory, the forms of the dependent variables need further explanation.

3.2.1 *Adverse Selection Costs in Trading (AS)*

The adverse selection component of the bid-ask spread has received increasing attention as a measure of informational efficiency. The market microstructure literature (see Copeland and Galai, 1983) argues that bid-ask

spreads have an information component due to the adverse selection faced by dealers when they trade with better informed traders. Dealers pass on potential losses incurred through dealing with informed traders via increased bid ask spreads. Key papers on empirical measures of bid-ask spreads and its component parts are: Glosten and Harris (1988), Stoll (1989), George, Kaul and Nimaendran (1991), Madhavan and Smidt (1991), Hasbrouck (1991), Foster and Viswanathan (1993), Lin, Sanger and Booth (1993), Madhavan, Richardson and Roomans (1997), and Huang and Stoll (1997).

In terms of the purposes of this paper, Brennan and Subrahmanyman (1995), using NYSE data, find a negative relationship between the adverse selection component of a spread and the number of analysts following a share. The number of analysts is used as a proxy for the number of informed traders and information production. As a word of caution, however, when Van Ness, Van Ness and Warr (2001) compared the adverse selection component of the bid ask spread to other measures of asymmetric information (market to book, volatility and institutional ownership) they found mixed results. For example, analyst forecast errors and market to book were found not to be related to the adverse selection component of bid-ask spreads and proxies for informed traders provided mixed results.

The adverse selection cost is estimated using high-frequency data. Two main different approaches, which are developed in the market microstructure literature, are used in the current study to characterise components of spreads; namely, the Glosten and Harris (1988) and Huang and Stoll (1997) models.

Glosten and Harris (1988) develop a price formation model where order

flow is uncorrelated through time. Δp_t can be written as :

$$\Delta p_t = c_0(Q_t - Q_{t-1}) + c_1(Q_t V_t - Q_{t-1}V_{t-1}) + z_0 Q_t + z_1 Q_t V_t + \varepsilon_t, \quad (1)$$

Where Δp_t is the transaction price change, V_t is number of share traded, Q_t is trade indicator variable which equals 1 (-1) if the trade at time t was a public buy (sell). The adverse selection cost of a transacting is $Z_t = (z_0 + z_1 V_t)$. The order processing and inventory holding components is $C_t = (c_0 + c_1 V_t)$. and ε_t is a zero mean disturbance term that reflects price changes due to the arrival of public information.

The average adverse selection component is calculated using the average transaction volume. The bid-ask spread in Glosten and Harris (1988) is the sum of the adverse selection, order processing and inventory holding components. The proportion which is the adverse selection components is calculated as following:

$$Z = \frac{z_0 + z_1 \overline{V}}{(z_0 + z_1 \overline{V}) + (c_0 + c_1 \overline{V})} \quad (2)$$

Another measure of adverse selection costs is obtained from Huang and Stoll's (1997) portfolio trading pressure model. The decomposition model is as follows:

$$\Delta p_t = \frac{S}{2}(Q_t - Q_{t-1}) + \alpha \frac{S}{2} Q_{t-1} + \beta \frac{S}{2} Q^*_{t-1} + \varepsilon_t, \quad (3)$$

where Δp_t is the transaction price change, Q_t is the trade indicator variable which equals 1 (-1) if the trade at time t was a public buy (sell), Q^*_t is the market wide trading pressure indicator which equals 1 (0, or -1) when the sum of all sample stocks of Q_t is positive (zero, or negative). β is

the adverse selection component expressed as the percentage of the spread. Because both measures produce similar results, only the results obtained using the Glosten and Harris (1988) measure are reported in this paper.

3.2.2 *Probability of Information-based Trades (PIN)*

In their analysis of the informational role of financial analysts, Easley, O'Hara and Paperman (1998) develop a new approach to looking at information. More specifically, they estimate the risk of information-based trading for a sample of NYSE stocks that differ in analyst cover. They use a model developed by Easley, Kiefer, O'Hara and Paperman (1996) in which the probability of informed trading can be directly estimated using the daily number of buys and sell orders. The idea of the model is that on days without private information a given buy and sell order flow is realised, while additional buy (sell) orders occur on days with positive (negative) private information about a stock's fundamental value. In this model, the daily number of buys and sells are sufficient to estimate the probability of informed trading (PIN).

The PIN approach to informed trading has been has been used by a number of authors (Easley, O'Hara and Srinivas, 1998, considered the informed trader's choice between stock and option markets, Easley, O'Hara, 2001, for stock splits, Grammig, Schiereck and Theissen, 2001, for informed trading on parallel markets and Easley, Hvidkjaer and O'Hara, 2002, for the impact on asset pricing). None the less, it needs to be recognised that the PIN model has a potential weakness in that every extraordinary trading activity is attributed to trading on private information. Recent evidence has shown that there is cross sectional correlation in order flow (Hasbrouck and Seppi, 2001, Chordia, Roll and Subrahmanyam, 2002) and, therefore, other factors not related to security-specific private information impact trading activity.

The Easley, Hvidkjaer, and O'Hara (2002) model is used to estimate PIN. The likelihood function is as follows:

$$\begin{aligned} L(\theta|B,S) &= (1-\alpha)e^{-\varepsilon_b}\frac{(\varepsilon_b)^{B_i}}{B_i!}e^{-\varepsilon_s}\frac{(\varepsilon_s)^{S_i}}{S_i!} \\ &+\alpha\delta e^{-\varepsilon_b}\frac{(\varepsilon_b)^{B_i}}{B_i!}e^{-(\mu+\varepsilon_s)}\frac{(\mu+\varepsilon_s)^{S_i}}{S_i!} \\ &+\alpha(1-\delta)e^{-(\mu+\varepsilon_b)}\frac{(\mu+\varepsilon_b)^{B_i}}{B_i!}e^{-\varepsilon_s}\frac{(\varepsilon_s)^{S_i}}{S_i!} \end{aligned} \tag{4}$$

Where B_i and $S_i$are the number of buy and sell trades on day i respectively. θ=$\{\alpha,\ \delta,\ \varepsilon,\ \mu\}$ are parameters to be estimated. The probability of information-based trade is calculated as

$$PIN = \frac{\alpha\mu}{\alpha\mu+\varepsilon_b+\varepsilon_s} \tag{5}$$

3.2.3 *The Market Impact of News (MIN)*

Different methodologies have been developed in finance research in order to quantify the market impact of news. The most widely used methodology is the event study method. It measures the market impact of news (events) by the abnormal return in the event window. It requires a benchmark period which is normal trading days without news release. The traditional event study method is constrained to study non-frequent and single isolated events for a sample of firms. Given the purpose of this paper is to analyze the relationship between corporate governance and information efficiency in general, the market impact of news cannot be constrained to only a few corporate news releases. To quantify the MIN measure in general, the accumulated impulse response (AIR) of market variables to all firm specific news are used. The AIR are obtained from a system of vector autoregressive

(VAR) models (see Hamilton, 1994: Ch11 for detailed discussions of VAR) with the number of news releases as an exogenous variable.

Generally speaking, impulse response coefficients are impact multipliers. They measure the impact of a one-unit change in one variable (number of news release) on the other variable (market variables such as volatility and volume) over time. The cumulative effects of unit impulses can be obtained by the summation of the coefficients of the impulse response functions over a period of time. For example, the five day market impact of news can be measured by the summation of impulse response coefficients over five days.

The cumulative impulse-response of volatility and volume to news is used as a measure of the market impact of news. The impulse-response functions are estimated from the following vector autoregressive regression (VAR) model with the number of regulatory news announcement (RNS) releases as the exogenous variable. The model is estimated using daily data.

The following form of VAR model is estimated:

$$\mathbf{y}_t = \mathbf{a} + \sum_{i=1}^{5} \mathbf{A}_i \mathbf{y}_{t-i} + \mathbf{b}x_t + \mathbf{e}_t \tag{6}$$

where $\mathbf{y}_t = (ALR_t, VOL_t)'$, ALR_t is the absolute log returns which is the measure of volatility and VOL_t is the log volume of trades at day t;

$x_t = RNS_t$, which is the number of RNS release at day t;

$\mathbf{a}$ = an (2×1) vector of intercept terms;

$\mathbf{A}_i = (2 \times 2)$ matrices of coefficients;

$\mathbf{b}$ = an (2×1) vector of coefficients;

and $\mathbf{e}_t$ = an (2×1) vector of error terms.

The impulse response coefficients $\mathbf{f}_i$ is an (2×1) vector which measures the effect of one unit RNS_{t-i} shock on ALR_t and VOL_t. These coefficient are impact multipliers. The accumulated effects of unit impulse in RNS_t

is obtained by the summation of the coefficients of the impulse response functions:

$$\mathbf{g}_n = \sum_{i=0}^{n} \mathbf{f}_i. \tag{7}$$

The five day cumulative impulse response coefficients are used to measure the impact of RNS release on volatility and volume response. In order to make these news impact measurement comparable cross firms, the cumulative impulse response coefficients are divided by volatility of daily return and average daily volume of the firms respectively to obtain standardized measures. Up to 12 days cumulative impulse response measures have been use to check the robustness of the results and no material differences were noted.

3.3 Descriptive Statistics

Descriptive statistics are provided in Table 2. The number of observations for each variable varies due to missing values and issues of estimation.

Table 2

3.3.1 *Dependent Variables*

In terms of the dependent variables, Table 2 shows that the various measures have average percentage values ranging from 9% for the bid-ask adverse selection measure (that is, 9% of the overall spread is a function of adverse selection) to 21% for the probability of an informed trade. Furthermore, these variables have quite large ranges; for example the market reaction measure for volume has a range from -61% to 62%.

3.3.2 *Independent Variables*

Table 2 shows that on average, companies in the sample had boards where 40% of the directors are independent, a size of 7 directors, 4% of the directors were from founding families and 88% had split the roles of the Chairman and CEO.

In terms of director characteristics, only 3% of the directors in the sample were female but 31% of the directors had professional qualifications.

The average shareholdings of directors other than founders were 6% and in terms of dominant shareholdings, the variable NumInstShare shows that on average companies had 4 institutional shareholders .

Finally, the average size of the companies in sales revenue is £237m and in market capitalisation £354m, the companies had an average return of capital employed of 13.8%, a gearing level of 27%, and a split between manufacturing, retail and other sectors in the ratio of 51%, 23% and 26%, respectively.

The above descriptive statistics indicate that while the sample is comprised of smaller cap companies, they are significant plc's with large sales revenues and market capitalisations. However, even this size of company is likely to differ in its governance characteristics from the very largest plc's (those in the FTSE 100 and FTSE 350) because of the need for the latter to have high degrees of transparency and alignment with the governance codes of practice. The key differences between the present sample and a sample of the very largest plc's are likely to consist of the following: because of their smaller size, lower market liquidity and reduced news flow/coverage, the current companies are likely to show greater reaction to an item of news; the boards are likely to be smaller, have fewer independent directors, have a greater percentage of founder directors, have a lower percentage split be-

tween Chairman and CEO roles, a lower degree of qualified directors, a higher percentage of director ownership and a lower number of institutional shareholders.

Given the above differences, we would expect the relationship between market reaction variables and governance variables to be stronger for the current sample than for the very largest plc's listed on the LSE. However, it needs to be borne in mind that the current sample of companies is more representative of the majority of companies listed on the LSE than is the case for the very largest companies.

4 Empirical Results

This section reports empirical results for each of the three separate information measures of the market response to news announcements.

The relationship between the information measures and the independent variables is estimated via the following general form using OLS and 3SLS (where appropriate).

$$\Omega_i = \boldsymbol{\beta}\mathbf{x}_i + \varepsilon_i \tag{8}$$

Where Ω_i are the information measures (AS, PIN, ALR5, or VOL5) of firm i; $\mathbf{x}_i$ is a vector of independent variables {LIND, LBoardSize, LFD, Split, LFEM, LProf, LNFDShare, LSales, ROCE, LGearing, LVol, STD, Manufactory, Retail}; $\boldsymbol{\beta}$ is a vector of coefficients and ε_i is the error term. We take natural logarithms of a number of the independent variables to mitigate heteroscedasticity.

4.1 The Adverse Selection Measure (AS)

This analysis uses a simultaneous equations approach to estimation following Brennan and Subrahmanyam's (1995) suggestion that active trading attracts informed traders and the resulting higher adverse selection costs tend to discourage discretionary liquidity trading and, therefore, a feedback loop is created between adverse selection and volume. To allow for this possibility we estimate the following equation system using 3SLS:

$$\begin{aligned} AS_i &= \boldsymbol{\beta}\mathbf{x}_i + \varepsilon_i \qquad (9) \\ LVol &= \alpha_0 + \alpha_1 AS_i + \alpha_2 STD + \alpha_3 LNumInstShare \\ &\quad + \alpha_4 LdirShare + \alpha_5 Lmarketcap \end{aligned}$$

This equation recognises that volume of trading is affected by information (AS), volatility (STD), ownership structure of the firm (LNumInstShare and LdirShare) and firm size (Lmarketcap). The 3SLS estimator is consistent and asymptotically efficient and more efficient than the 2SLS estimator.

Table 3

The 3SLS estimates shown in Table 3 indicate that larger boards affect how a news announcement is impounded into the adverse selection component of the bid ask spread. More specifically, larger boards tend to reduce the adverse selection component and this suggests that the potential independence of larger boards carries higher credibility in terms of news announcements. Similarly, where the roles of CEO and Chairman are split, it leads to a reduced amount of adverse selection. Hence, boards which have greater independence in terms of the Chairman/CEO roles being separated are given more credibility in the stock market. In contrast to these two sets

of results, the significant, positive coefficient on the percentage of directors which are members of the founding family (FD) suggests that boards are given less credence where there are more founding family directors. The adverse selection components are larger when there are higher levels of family board representation. This result supports the argument that founding directors have every incentive to maximise the value of the firm and hence may have a tendency to promote good news and hold bad news back. The results for the cumulative impulse response function for volatility (ALR) gives further support of this finding; namely, news is given less credence where there are more founding family directors..

The negative coefficient for the number of institutional shareholder (LNumInstshare) is consistent with Ness, Ness, and Warr's (2001) finding. It supports the arguments that a greater number of institutional owners could reduce adverse selection costs as many institutions compete with each other and the dealer to profit from their private information. However, neither of the ownership variables is significant which suggests that after controlling for corporate governance characteristics the effects of ownership structures on information asymmetry is not substantial.

Both of the control variables which are statistically significant (Volume and Manufacturing) decrease the adverse selection component. Where there is a lot of trading in a stock, the information asymmetry in the security market is lower and a similar effect is found for those companies in the manufacturing sectors. The influence of the independent and control variables on the adverse selection measure of information can be gauged by the adjusted R squared having a value of approximately 30%.

Overall, these first set of results give support for governance variables concerned with boards, but not ownership, influencing the information risk

in security markets. Thus while governance variables have been found to have an impact on the performance of companies, the results reported here also indicate that governance variables influence the information efficiency of their stock.

4.2 The Probability of Information-based Trade Measure (PIN)

The results for the probability of informed trading measure shown in Table 4 provide further support to governance variables having a meaningful influence. However, because the PIN measure focuses on the likelihood of private-informed trading, it provides a different insight into the information efficiency. The PIN measure only has 71 observations because the algorithm used to derive this measure did not converge in 43 cases.

Table 4

The only variable to be significant is the percentage of directors having professional qualifications. In other words, there are more private-informed trades in stocks where news announcements are prepared or signed off by directors who have professional qualifications. This result contrasts with findings of Ahmed and Nicholls (1994) who found that qualified directors receiving more professional training may disclose more information. However, this result is consistent with the finding for the MIN measure and supports an alternative argument which is explained in next section.

The other variables concerned with the independence of the board and ownership structure have little significant impact on the probability of informed trading. In general, the results for the PIN measure show little significance and the R squared measure has a value of 0.0062.

4.3 The Market Impact of News Measure (MIN)

The final measure of the market reaction to news is the cumulative 5 day response of volatility and volume to news. While the PIN measure in the last section focused on private information, the MIN measures concentrate on the impact of public announcements.

The results shown in panel A of Table 5 emphasise the importance of directors having professional qualifications and show that the impact of news announcements on volatility is less if the directors have professional qualifications. This is consistent with the result from the PIN regression. As the PIN measures the probability of trades based on private information, results in Table 4 shows that this probability is higher for companies having more qualified directors. On the other hand, the MIN measures presented here are estimates based on public information. Over all, these results support the arguments that qualified directors are able to manage news announcement in a way that minimize the market impact. However, the downside of doing so is that it creates more opportunity for private-informed traders. Similarly, public news is given less credence when more founding family directors are present as Table 5 shows that the impact of public news to volatility and volume are both lower if there is a higher percentage of founding directors on the board.

Table 5

The R squared values show , although not as high as the case for the adverse selection measure, that the independent and control variables explain approximately 7.5% of the variation in the cumulative impulse response measures.

5 Conclusions

This paper explores a new area of corporate governance research (namely, the effect of corporate governance variables on the market reaction to news) and brings together literatures in corporate governance, disclosure and informational efficiency (especially from a micro structure perspective) to examine the impact of governance characteristics on information efficiency in security market.

Overall, the results indicate that a small group of governance variables (board size, Chairman/CEO split, the presence of founding directors and directors having professional qualifications) affects the information efficiency in a security market. These results suggest that the market places some weight on the board being independent, directors having an ongoing interest in the business (founding directors) and directors having the reputations and abilities associated with professional qualifications.

Given the positive results of this exploratory study in terms of establishing a relationship between information efficiency and governance variables, there is a clear need for further work. A future research programme in this area will need to address how governance variables impact on the market reaction to news when news quality is categorised, different types of news are isolated and larger firms are considered. Furthermore, the research could be usefully replicated on a larger sample of companies, across a longer time period and for different institutional settings. In short, the results for this first exploratory study suggest that there might be quite a lot of mileage in analysing in detail how and why the market reaction to news is conditioned by governance variables.

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Table 1 Variables Description

Dependent Variables		
Adverse Selection	AS	Adverse Selection Component of Bid-ask Spread estimated using Huang and Stoll (1997) market pressure model.
Probability of Informed Trades	PIN	Probability of Informed Trades estimated using Easley, O'Hara and Paperman (1998) model.
Market Impact of News	ALR5, VOL5	The 5-day cumulative impulse response of volatility and volume to news estimated from the VAR model.
Independent Variables		
Board Characteristics		
Board Independence	LIND	Log percentage of independent directors on board.
Board Size	LBoardSize	Log total number of directors on board.
Founder	LFD	Log percentage of number of founding family directors on board.
CEO/Chairman Split	Split	Dummy variable which equals one for companies where CEO and Chairman positions are not held by the same person, and zero otherwise.
Director Characteristics		
Gender	LFem	Log percentage of female directors on board.
Professional Background	LProf	Log percentage of directors holding professional qualification such as (ACA, ACCA, CIMA, etc.).
Ownership structure		
Shareholding of the Board of Directors	LDirShare	Log percentage of shareholding of all directors.
	LNFDShare	Log percentage of shareholding of non-founder family directors.
Dominant Shareholding	LNumInstShare	Log number of institutional share holders whose holding is larger than 3 percent in the firm
Control Variables		
Size	LSales	Log of sales in million pounds
	LMarketCap	Log of market capitalization in million pounds
Profitability	ROCE	Return on capital employed
Risk	Gearing	Debt divided by debt plus equity
Volume	LVol	Market turnover which is measured as the daily volume of trades over market capitalisation
Volatility	STD	Standard deviation of daily returns
Industry dummies	Manufacturing	Equal to one if a company is in the manufacturing industry (UK-SIC code between 15 to 45)
	Retail	Equal to one if a company is in the retail industry (UK-SIC code between 50 to 63)

Table 2 Descriptive Statistics of Variables

	Mean	Min	Median	Max
Dependent Variables				
AS	0.09	0.01	0.08	0.44
PIN	0.21	0.04	0.21	0.33
ALR5	0.08	-0.18	0.05	0.67
VOL5	0.02	-0.61	0.01	0.62
Independent Variables				
Board Characteristics				
IND	0.40	0.00	0.40	0.77
BoardSize	7.23	4.00	7.00	13.00
FD	0.05	0.00	0.00	0.40
Split	0.88	0.00	1.00	1.00
Director Characteristics				
Fem	0.03	0.00	0.00	0.43
Prof	0.31	0.00	0.25	1.00
Ownership Structure				
DirShare	0.10	0.00	0.04	0.71
NFDShare	0.06	0.00	0.02	0.50
NumInstshare	4.28	0.00	4.00	11.00
Control Variables				
Sales (m)	237.82	2.08	152.75	1548.83
Marketcap (m)	354.31	1.30	137.25	6192.83
ROCE	13.81	-99.96	14.92	84.31
Gearing	27.00	0.00	24.07	98.11
Vol	0.42	0.00	0.13	4.68
Std	0.32	0.01	0.19	2.14
Manufacturing	0.51	0.00	1.00	1.00
Retail	0.23	0.00	0.00	1.00
Other Industry	0.26	0.00	0.00	1.00

Table 3 Adverse Selection (AS) Regression

This table presents regressions of corporate governance variables on the adverse selection measure of FTSE smallcap companies. The sample period is the accountancy year end in 2000. The regressions are estimated using 3SLS. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

AS Equation			
Parameter	**Estimate**	**tValue**	
Intercept	0.2306	2.65	***
Board Characteristics			
LIND	-0.0045	-1.23	
LBoardSize	-0.0506	-1.73	*
LFD	0.0057	2.60	**
Split	-0.0368	-1.88	*
Director Characteristics			
LFem	0.0039	1.56	
LProf	-0.0019	-0.94	
Ownership Structure			
LNFDShare	-0.0027	-0.61	
LNumInstshare	-0.0044	-0.43	
Control Variables			
LSales	0.0036	0.54	
ROCE	0.0001	0.21	
Gearing	-0.0007	-0.34	
Vol	-0.0170	-2.53	**
Std	-0.0301	-1.43	
Manufacturing	-0.0303	-1.93	*
Retail	-0.0127	-0.63	
adjRsq	0.2929		

Lvol Equation			
Intercept	6.0459	6.18	***
AS	-0.0128	0.00	
Std	1.8272	4.18	***
LNumInstshare	0.0657	0.37	
LDirShare	0.0179	0.27	
Lmarketcap	-0.7383	-8.22	***
adjRsq	0.5294		

Table 4 Probability of Information-based Trade (PIN) Regression

This table presents the OLS regression of corporate governance variables on the PIN measure of FTSE Smallcap companies. The sample period is the accountancy year end in 2000. *,** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Parameter	**Estimate**	**tValue**	
Intercept	0.3034	2.45	**
Board Characteristics			
LIND	0.0014	0.28	
LBoardSize	-0.0509	-1.27	
LFD	-0.0018	-0.53	
Split	0.0187	0.67	
Director Characteristics			
LFem	-0.0036	-1.03	
LProf	0.0048	1.74	*
Ownership Structure			
LNFDShare	0.0031	0.46	
LNumInstshare	-0.0053	-0.85	
Control Variables			
LSales	-0.0044	-0.47	
ROCE	-0.0003	-0.61	
Gearing	-0.0002	-0.09	
Vol	-0.0044	-0.60	
Std	0.1051	1.58	
Manufacturing	-0.0074	-0.31	
Retail	0.0205	0.72	
adjRsq	0.0062		

Table 5 Market Impact of News (MIN) Regression

This table presents the OLS regressions of corporate governance variables on the MIN measure of FTSE Smallcap companies. The sample period is the accountancy year end in 2000. Panel A reports the reports the results for the volatility measures (ALR) and panel B for the volume measure (VOL). *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

	A. ALR			**B.VOL**		
Parameter	**Estimate**	**tValue**		**Estimate**	**tValue**	
Intercept	0.2699	1.39		-0.0412	-0.27	
Board Characteristics						
LIND	0.0020	0.24		0.0034	0.52	
LBoardSize	-0.0059	-0.09		-0.0117	-0.23	
LFD	-0.0091	-1.75	*	-0.0072	-1.78	*
Split	0.0089	0.19		-0.0004	-0.01	
Director Characteristics						
LFem	-0.0012	-0.21		0.0037	0.85	
LProf	-0.0080	-1.73	*	-0.0054	-1.52	
Ownership Structure						
LNFDShare	0.0101	1.02		0.0020	0.26	
LNumInstshare	0.0136	0.58		-0.0025	-0.14	
Control Variables						
LSales	-0.0196	-1.32		0.0050	0.43	
ROCE	0.0010	1.32		-0.0001	-0.10	
Gearing	0.0015	0.31		-0.0038	-0.99	
Vol	0.0012	0.11		-0.0052	-0.63	
Std	-0.1246	-2.75	***	-0.0083	-0.24	
Manufacturing	-0.0101	-0.29		0.0086	0.31	
Retail	0.0303	0.66		0.0114	0.32	
adjRsq	0.0750			-0.0593		