



Department of
Economics and Finance



1. Introduction

In this paper we relate corporate governance mechanisms to measures of asymmetric information, specifically the bid ask spread for shares, share return volatility and share trading volume. Shareholders are well aware that managers can impose agency problems through shirking and consuming excess perquisites (Jensen and Meckling, (1976); Fama and Jensen (1983)) but unlike the managers, shareholders are uncertain as to the extent of these problems. This can lead to higher bid ask spreads, volatility and lower share trading volumes as this uncertainty can cause shareholders to be more cautious in buying shares than they would be in the absence of this information asymmetry.

Best practise in corporate governance can deal with the impact of this information asymmetry in several ways. For example, some elements of best practise in corporate governance such as an independent board of directors encourages the monitoring of managers thereby making it difficult for managers to conceal shirking and personal perquisite consumption. As another example, compensation schemes such as share compensation reward managers for reducing agency problems. To the extent that a corporation has in place the elements of best practice in corporate governance, shareholders can have greater confidence that agency problems are under control. In turn this greater confidence can lead to lower bid ask spreads, lower share return volatility and higher share trading volumes as shareholders are less cautious in acting on new information and trade in shares as they are less concerned about agency problems than they would have been in the absence of these corporate

Our study is motivated by the theoretical work of Diamond (1985) and Diamond and Verrecchia (1991), who emphasize the effects of asymmetric information among the management of the firm and the shareholders on the

proxies for aspects of corporate governance to explain five measures of asymmetric information all the while controlling for self-selection bias, and size and industry effects.

We explore five elements of corporate governance that can be used to control agency problems either by enhancing monitoring systems or by incentivizing managerial behaviour.

these agency problems is known to the market (Jensen and Meckling, (1976); Fama and Jensen (1983)).

Corporate governance mechanisms are an indirect and probably imperfect tool by which shareholders, as principals, attempt to control agency problems by changing the behaviour of managers, who are the agents of the shareholders (Deshmukh (2005), Kanagaretnam, Lobo and Whalen (2007); Chen et al. (2007); Connelly et al. (2009)). Managers' actions can be changed by mitigating the effects of asymmetric information in many ways. For instance, a significant portion of managerial compensation can be tied to the share price via share price compensation thereby linking higher compensation to lower shirking and perquisite consumption. In addition, corporate governance mechanisms can

di295585()-2wJ -262.475 -27.6 Td [74()-250.295(c)659(g)9.(c)659(g)9.(c)659(75 -27.6 Td [74()-250(n)-0.

the underinvestment problem. Wruck (1993) and Kang, Kumar and Lee (2006) examine the importance of the form of executive compensation in reducing agency problems and mitigating asymmetric information. Chi and Scott-Lee (2010) show that high amounts of free cash flow strengthen the influence of the quality of corporate governance practices on firm value and Chen et al. (2013) find that external financing needs are inversely related to information asymmetry. Belghitar and Khan (2011) suggest that internal governance mechanisms are more effective for enterprises with high growth investment opportunities, while external governance me39()-420.395(s)-20.395(s)-2715(g)9.71032(h)-0.295Br e eme nnt2.16436(t)-

et al. (2006) note that in recent years, boards are being pressured into becoming more diverse in the belief that more diverse boards will be more effective monitors of management. Adams and Ferreira (2009) find that gender diverse boards allocate more effort to monitoring. Thus, we expect that the greater the diversity of the board, the more effective the board will be in monitoring management and the greater control will be placed on agency problems leading to lower spreads, volatility and higher share trading volume. In summary our first hypothesis can be stated as follows.

H1. Ceteris paribus, there is an inverse relationship between boards that are more independent, expert and diverse and the degree of asymmetric information.

Our second governance category considers the activeness of the board of directors. More active boards should be more effective monitors of management leading to greater control of agency problems. For example, Kanagaretnam et al. (2007) suggest that boards and committees that meet more frequently are likely to be monitoring management more closely. In turn, more effective monitoring of management will lead to greater control of agency problems and greater shareholder confidence in the share price leading to lower bid ask spreads and volatility and higher trading volumes.

However, board meeting attendance and the number of board meetings can be directly rather than inversely related to measures of asymmetric information as higher attendance and more meetings are needed to respond to controversies. Specifically, the surrounding uncertainty regarding the resolution of controversies can cause the bid ask spread and volatility to rise and the trading volume to fall just as more meetings and higher attendance occur to resolve these controversies. Therefore our second hypothesis is as follows.

H2. Ceteris paribus and controlling for controversies, more active boards are inversely associated with measures of asymmetric information.

Our third governance category considers the impact of compensation schemes for senior executives. Performance-related pay is designed to enhance shareholder value by

The effect of ownership concentration on asymmetric information is uncertain. On the one hand, Shleifer and Vishny (1997), Florackis and Ozkan (2009), Gul et al. (2010), Lin et al. (2011) and Jiang et al. (2011) suggest that large shareholders are effective in supervising management. Leung and Horwitz (2010) show that firms with a more concentrated management (executive board) ownership displa66y293142(g)9.7547792(c)3.74(e)3.74(n)-0.293r.16436(h).

(2012) find that loan terms are more favourable for boards that minimize information risk.

This leads to our fourth hypothesis:

control for industry effects by employing a dummy variable for firms in the CONSUMER SERVICES and INDUSTRIAL industry sectors.

[Please Insert Table 1 About Here]

4.1 Measuring Asymmetric Information

As there is no generally accepted “best” measure of asymmetric information, we choose four that are most commonly used in the literature: the bid ask spread, volatility, share volume measured at market prices and the number of shares traded.² The definitions of all asymmetric information, governance and control variables and the expected signs of the coefficient’s relation to asymmetric information are reported in Table 2.

[Please Insert Table 2 About Here]

Studies by George et al. (1991), Lin, Sanger and Booth (1995), Madhavan, Richardson and Roomans (1997) and Huang and Stoll (1997) analyse the bid-ask spread into its order processing, inventory holding and asymmetric information components. However, Van Ness,

average volatility in stock returns VOLATILITY, the higher will be the degree of asymmetric information.

We use share trading volume as our third measure, since Draper and Paudyal (2008) indicate that the average trading volume is inversely related to asymmetric information. According to Van Ness et al. (2001), average trading volume is related to information asymmetry because less is known about less frequently traded stocks. Acker, Stalker and Tonks (2002) report that high trading volumes are associated with closing prices that are more often within the daily spread and indicates lower levels of information asymmetry. Gajewski (1999) finds that trading volume is larger on announcement days, suggesting that higher trading volumes are associated with the possible release of information. Hence, we expect that the higher the average trading volume, the lower will be the degree of asymmetric information. As trading volume can be measured according to the number of shares or the value of shares traded we chose to measure trading volume both ways. Therefore TRADE VOLUME is the number of shares traded for a company in a given year normalised by the number of shares in issue whereas TRADE VALUE is the market value of a stock traded for a company in a given year, both of which are decreasing in asymmetric information.

Finally, as a robustness check, we construct a composite variable of the above conventional measures of asymmetric information COMPOSITE. We conduct a principal component analysis of SPREAD, VOLATILITY, TRADE VOLUME and TRADE VALUE and find that the first principal component is AM

associated with TRADE VOLUME, relations that are the same as those between these proxies and asymmetric information.

4.2. Measuring Corporate Governance

We develop eight proxies for corporate governance, grouped into five categories. Specifically, the five categories are board composition, board activity, executive compensation, ownership concentration and debt financing. We also incorporate two control variables, MARKET VALUE to control for firm size and the number of controversies

CON5(n)-0.29ENor153 thn(n)8416436(r)2.809641.5255885(f)2.80439()-3.74(o)064z47(M)1.52(A)-8.430

financial expert within the meaning of the Sarbanes-Oxley Act. Evidently the Financial Reporting Council supported by evidence from Chahine and Filatochev (2011) believes that the greater technical expertise of the audit committee, the more effective this committee will be in monitoring the accounting system and by implication, agency problems and the performance reward systems. This will lead to greater shareholder confidence in the reported results and greater confidence that agency problems are under control. Therefore we expect an inverse relation for audit committee expertise EXPERT and proxies for asymmetric information.

Finally, Cai et al. (2006) and Adams and Ferreira (2009) suggest that gender diverse boards allocate more effort to monitoring. Thus, we expect that the greater the fraction of females on the board FEMALE, the more effective the board will be in monitoring management and the greater control will be placed on agency problems leading to lower spreads, volatility and higher share trading volume.

Our second hypothesis suggests that, controlling for controversies, more active boards are inversely associated with measures of asymmetric information. We proxy the activeness of the board as the annual number of meetings of the board of directors BOARD MEETS and the overall percentage attendance of members of the board ATTENDANCE. Therefore, there should be an inverse association between measures of asymmetric information and more frequent board meetings with higher attendance. However, board meeting attendance and the number of board meetings can be directly rather than inversely related to measures of asymmetric information as higher attendance and more meetings are needed to respond to controversies. Therefore, to control for this effect we include a variable CONTROVERCIES that counts the number of times during the year the company had a controversy as reported in the financial press. We expect the value of this coefficient to be positively related to the bid

According to our third hypothesis, we expect an inverse relation between the presence of compensation packages that include stock compensation and measures of asymmetric information. We use a dummy variable STOCK COMPENSATION that takes on the value of one if senior executives receive compensation in the form of stock. Therefore, we expect that the STOCK COMPENSATION coefficient is negative. In contrast, the effect of ownership concentration on asymmetric information is uncertain as the relation can be inverse if dominate shareholders are more effective monitors of management or the relation can be positive if there is a fear that dominate shareholders influence management to take actions to their benefit against smaller shareholders' interests. Therefore our measure of ownership concentration, the single largest percentage ownership by an investor BIG OWN, can be positive or negative.

Finally, our fourth hypothesis suggests that is an inverse relation between the level of debt and proxies for asymmetric information as larger debt incentivises debt holders to monitor management. We use the total debt to total

well as SPREAD and VOLATILITY can reinforce the conclusions obtained by separately using the first four proxies for asymmetric information.

<<Table 3 about here>>

4.3. The model

We collect a panel data series for all 324 firms annually from 2004 to 2010, potentially 2,268 observations. We have about half of these potential observations because of the turnover of listed companies for the reasons outlined above. Consequently, our unbalanced panel data has a large number of individuals, 324 companies, and a small time series, at most seven years. We conduct a Hausman specification test finding that the coefficients estimated via random and again using fixed effects estimators are not statistically different.⁵ Based on this test, we follow the recommendations of Judge, Griffiths, Hill, Lutkepohl & Lee (1985), page 527-9, and use the random effects estimator. Moreover, an analysis of variance test does reveal clear c 1 -140.229(r)2.80439(3 ()-150.235(d.74()-150.1)-2.16436(e)

as it accounts for the influence of self-selection on asymmetric information. Then, the second stage asymmetric information regression can measure the relation among proxies for

$$\begin{aligned}
Y_{i,j,t} = & \alpha + \beta \text{INDEPENDENCE}_{i,t} + \beta \text{EXPERT}_{i,t} + \beta \text{FEMALE}_{i,t} + \beta \text{ATTENDANCE}_{i,t} \\
& + \beta \text{BOARD MEETS}_{i,t} + \beta \text{CONTROVERCIES}_{i,t} + \beta \text{STOCK COMPENSATION}_{i,t} \\
& + \beta \text{BIG OWN}_{i,t} + \beta \text{DEBT RATIO}_{i,t} + \beta \text{MARKET VALUE}_{i,t} + \beta \text{MILLS RATIO}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{2}$$

where:

j = 1 = SPREAD,

j = 2 = VOLATILITY,

j = 3 = TRADE VOLUME,

j = 4 = TRADE VALUE,

j = 5 = COMPOSITE

and α is the regression intercept, $\varepsilon_{j,i,t}$ is the random error term for each regression j and company i and date t and MILLS RATIO is the estimated inverse mill's ratio from (1). All other variables are as previously defined. Accordingly, we study the effect of corporate governance variables on proxies for asymmetric information using five (j) panel regression models on 324 (i) companies of (potentially) seven (t) time series observations each using a random effects estimator adjusted for time effects all of which are corrected for self-selection bias.

5. Empirical Analysis

Table 4a presents the results of the selection equation (1). These estimates show that governance systems that receive the highest ranking are the ones that have more independent INDEPENDENT, active BOARD MEETS and diverse FEMALE boards that reward senior executive with STOCK COMPOSITION. Firms with larger inside ownership BIG OWN have lower rankings. Meanwhile, larger firms MARKET VALUE receive higher rankings than smaller firms, firms with tangible assets INDUSTRIAL receive higher rankings and

5.2. Board Activity.

We find strong support for H2 as once we correct for the confounding effects of CONTROVERCIES, active boards are inversely related to proxies for asymmetric information. ATTENDANCE is significantly related to SPREAD, VOLATILITY, TRADE VALUE and COMPOSITE and BOARD MEETS is significantly related to SPREAD, TRADE VOLUME and COMPOSITE, meaning that more frequent and well attended board meetings are inversely associated with proxies for asymmetric information. Interestingly, the number of CONTROVERCIES reported in the financial press for the year is directly associated with SPREAD. If we remove this variable, BOARD MEETS and ATTENDANCE often drop in significance in Table 4b and falls from significant to insignificant in some of the later robustness regressions. This indicates that indeed it is valuable to control for controversies because extra meetings can be sche5(t)-2.164363.74(5(t)-2.16436.396(r)2.8B1436(r)2.80439

parsimonious regression in Table 5b. These results are repeated in Table 6 panel B for the

7. Summary and Conclusion

Using a sample of 324 non-financial UK companies from 2004 to 2010, we examine the relationship among corporate governance mechanisms and asymmetric information. While corporate governance mechanisms are designed to mitigate agency problems, they can also alleviate investor's concerns regarding an agency problem information asymmetry. Specifically, shareholders are well aware that managers can impose agency problems through shirking and consuming excess perquisites but unlike the managers, shareholders are uncertain as to the extent of these problems. We examine whether, after correcting for self-selection bias, adopting best practise in corporate governance alleviates investors' concerns regarding agency problems, thereby enhancing their confidence in the valuation of the company and improving the informational environment of the firm.

We find evidence that there is an inverse relation

This study is limited in that it focuses on UK non-financial firms suggesting that future research could extend this study to other de

Table 1
Sample composition by industry

<i>Industry</i>	<i>Number</i>	<i>Percentage</i>	<i>DEBT RATIO</i>	<i>Market Value (in £ millions)</i>
Basic Materials	24	7.41	16.70	9,829
Oil and Gas	24	7.41	19.82	7,775
Industrials	83	25.62	22.55	1,443
Consumer Goods	33	10.19	23.23	5,396
Health Care	10	3.09	19.08	12,478
Consumer Services	88	27.16	31.63	2,439
Telecommunication	5	1.54	30.31	25,388
Utilities	12	3.70	42.97	6,284
Real Estate	22	6.79	39.82	1,144
Technology	23	7.10	11.52	825
Total	324	100.00	25.68	3,917

Notes: The target population includes all non-financial UK companies listed in DataStream's Corporate Governance Database during the period 2004 to 2010. 'Industry classification' is made according to the nomenclature of the Industry Classification Benchmark developed by Dow Jones. 'Number' refers to the number of companies in a given industry, 'percentage' refers to the percentage of the total sample represented by each industry and total DEBT RATIO and market value reports the respective averages by industry.

Table 2
Variables and Definitions

<i>Variable</i>	<i>Expected relation with asymmetric information</i>	<i>Definition</i>
		Asymmetric information
SPREAD	(+)	The percentage change in the bid ask spread from the previous day to today averaged over the year.
VOLATILITY	(+)	The annual average of daily stock return volatility
TRADE VOLUME	(-)	The number of shares traded for a stock in a given year divide by the number of shares in issue.
TRADE VALUE	(-)	The market value of a stock traded in a given year, in millions
COMPOSITE	(+)	The first principal component of SPREAD, VOLATILITY, TRADE VOLUME and TRADE VALUE based on the correlation among them.
		Governance quality
G		A dummy variable that takes on the value of 1 if the quality of the company's corporate governance is judged by DataStream to be greater than or equal to the median score for the quality of corporate governance for firms on the FTSE 100, zero otherwise.
		Board Composition
INDEPENDENCE	(-)	Percentage of independent board members
EXPERT	(-)	b A percentage ranking by DataStream. KeKH''0a9NI'N:E:0g9RI'N:HNd ge

Table 6**Robustness checks between corporate governance and asymmetric information: Stability by Economic Conditions**

		<i>Panel A: Parsimonious 2004 to 2007</i>									
Variable		SPREAD (+)		VOLATILITY (+)		TRADE VOLUME (-)		TRADE VALUE (-)		COMPOSITE (+)	
		Coef.	T-Stat	Coef.	T-Stat	Coef.	T-Stat	Coef.	T-Stat	Coef.	T-Stat
CONSTANT		6.37***	9.25	3.81***	3.86	-6.61	-1.57				

Table 7

Robustness checks between corporate governance and asymmetric information: Stability by year using TRADE VOLUME as the proxy for asymmetric information.

Parsimonious Model

