How Does Directors Remuneration Affect SMEs' Performance?

ABSTRACT

Purpose – The purpose of this paper is to explain empirically the relationship between the remuneration levels of a sample of listed Small and Medium Enterprises (SMEs) directors and firm performance. The paper also investigates whether deviations from the optimal directors' remuneration level reduce firm performance.

Design/methodology/approach – The study uses a panel data regression analysis of 802 AIM-listed SMEs over an eight-year period (2005-2012).

Findings – Using a non-linear approach, the results show that an optimum director's remuneration level exist which results from comparing the benefits and costs of director's remuneration. Hence, the paper does not only show how directors' remuneration level affects firm performance, it also extends the stream of knowledge by indicating how a deviation from the optimal point influences UK-listed SMEs performance. **Moreover, the results show that the effect of directors' remuneration on firm performance is greater during financial crisis period.**

Originality/value – Compared with previous literature on directors' remuneration, this paper focuses on AIM-listed SMEs and our finding of a concave relationship between directors' remuneration level and performance of leads us to recommend that firms, especially SMEs should endeavour to determine the optimal level of directors' remuneration to maximise performance.

Keywords

Directors' remuneration; SMEs; AIM; Performance; UK

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1. INTRODUCTION

This article attempts to explain empirically the relationship between the remuneration levels of a sample of listed Small and Medium Enterprises (SMEs) directors and firm performance over the period 2005−2012. A number of previous studies (Murphy, 1985; Main et al., 1996; Wan et al., 2000; Stathopoulos et al., 2004; Doucouliagos et al., 2007; Gregg et al., 2012) have investigated the relationship between directors' remuneration and performance (**as measured by shareholder return**). This is because remuneration is widely seen as a means to bridge the interest gap between shareholders and directors (Jensen and Murphy, 1990). As argued by Jensen and Murphy (1990), directors pay **(including cash, options, stockholdings, and dismissal)** can limit agency problems by aligning the interests of managers and shareholders. Doucouliagos et al. (2007) suggest that remuneration can be used to solicit directors' efforts, reward productivity and ensure compliance with shareholders' interests. Amess and Drake (2003) allude that directors' remuneration is a potentially potent device by which to attenuate managerial opportunistic behaviour. However, many recent studies have reignited the debate as to whether directors' remuneration mitigates the agency conflicts in modern corporations (Goering, 1996; Murphy, 1997; Grundy and Li, 2010; Van Essen et al., 2012). **Zajac and Westphal (2004) argue that the theory could become the dominant institutional logic for corporate governance.**

There have been many recommendations regarding directors' remuneration including the disclosure of directors' remuneration and the setting up of remuneration and audit committees (Greenbury, 1995). For example, Greenbury (1995) suggests that directors' remuneration should have strict performance criteria. In this paper, we focus on the cash

remuneration part of directors' remuneration package, which includes basic salaries and bonuses. This is because the cash remuneration of firms has increased immensely over the past decade (Doucouliagos et al., 2007), and our data shows that only a handful of SMEs give non-cash incentives. For example, research by Gregg et al. (2005) indicates that the cash compensation of UK firm directors has been rising by an average of 10% per annum. Therefore, understanding the relationship between cash compensation and performance is important and germane. There have been many studies that have examined the cash remuneration of firms due to the difficulty in obtaining information on incentive-based remuneration (see, Murphy, 1999). For example, Murphy (1999) drew a distinction between cash remuneration and total remuneration.

There have been widespread concerns over directors' remuneration, in particular for those firms who are not performing (Scholtz and Smit, 2012). Directors' remuneration has attracted the attention of investors, the media, trade unions, researchers and the general public (PWC, 2009). The Economist (2004) highlights that the huge salaries for executives would be much less controversial if there were evidence that the executives earned these salaries. Some of the high remuneration packages to directors of the underperforming firm include the $380,619 in cash and stock paid to Enron directors in 2001 in the United States (The New York Times) has posed a question as to whether higher remuneration leads to higher firm performance.

Whiles lower remuneration package could result in poor performance because it will not motivate the directors to work hard in a way which is acceptable to shareholders (Carlos and Nicolas, 1996; Scholtz and Smit, 2012), excessive remuneration could lead to poor firm performance because well-remunerated directors may be less likely to "rock the boat" (Scholtz and Smit, 2012). For example, it is widely believed that the excessive remuneration of Enron's directors may have caused their objectivity to be comprised in monitoring management on

behalf of the shareholders. Based on the two contrasting effects of director's remuneration on firm performance, it can, therefore, be argued that an optimal remuneration level may exist at which the performance of the firm is maximised. This means that the relationship between directors' remuneration and performance may be concave instead of the linear as previously suggested.

Examination of the link between directors' remuneration and performance of SMEs is crucial, given that SMEs lack financial resources (Whited, 1992; Fazzari and Peterson, 1993; Peterson and Rajan, 1997). Financial resources have been identified as the most significant challenge facing SMEs (Abor and Quartey 2010; Lader 1996; Cook and Nixson 2000; Parker et al. 1995). Hutchinson and Xavier (2006) suggest that SMEs face more difficulties in raising finance than larger ones. According to Abor and Quartey (2010), formal finance institutions have tailored their products to best serve the needs of larger corporations. This means that while SMEs should be able to attract capable directors who can make maximum use of the limited resources; at the same time, the lack of resources will make any excessive remuneration to be detrimental to performance. Watson et al. (1994) believe that existing theories and empirical findings of directors' pay based upon large firms will be of limited relevance to understanding the factors influencing the remuneration of directors in SMEs.

The ability of SMEs to determine the directors' remuneration level at which performance is maximised is beneficial to all economies of the world, given that the majority of firms around the world are SMEs (Abor and Quartey, 2010). SMEs are the mainstay of economic development in most countries around the world (Beaver and Prince, 2004; Lukacs, 2005; Newberry, 2006). For example, the Department for Business Innovation and Skills (2011) states that the number of SMEs in the UK is 99.8 percent of all the firms, accounting for 50.1 percent of turnover. Given the economic contribution that SMEs make, Chittithaworn et al. (2011) argue that the performance of the SME sector is closely associated with the

performance of a country. This means that any policy implications derived from researching the remuneration level at which SMEs performance is maximised have the potential to influence the country's economic growth, which impacts on the welfare of its citizens.

2. THEORETICAL FRAMEWORK

There are some theories (e.g. agency theory, tournament theory, stewardship theory) that explain the influence of directors' compensation on firm's performance. Hillman and Dalziel (2003) argue that one of the distinctive paths followed by researchers seeking evidence of links between boards of directors and firm performance is agency theory. Agency theory is of the assertion that improved firms' performance can be achieved by increasing the remuneration of directors (Smith and Watts, 1992). Although the agency theory first appeared in the academic economic literature in the early 1970s (see Spence and Zeckhauser, 1971; Ross, 1973), it has since been applied in many other fields like accounting (e.g., Demski and Feltham, 1978), finance (e.g., Fama, 1980), marketing (e.g., Basu et al., 1985), political science (e.g., Mitnick, 1986), organisational behaviour (e.g., Eisenhardt, 1985, 1988; Kosnik, 1987), and sociology (e.g., Eccles, 1985; White, 1985).

Miller and Sardais (2011) argue that agency theory is based on the assumption that agents tend to be selfish opportunists who, without effective monitoring, will exploit their owners. This conflict of interest would arise as a result of the separation of ownership and control in the organisation (Berle and Means, 1932; Fama and Jensen, 1983). Proponents of the theory argue that the primary function of boards is to protect the interests of shareholder (principals) (Eisenhardt, 1989; Jensen and Meckling, 1976; Mizruchi, 1983). Hence, the compensation package given to directors and managers is explained by the agency theory to help align the interests of directors and managers to those of shareholders (Boyd, 1994; Dalton et al., 2003; Elson, 1995). The agency theory assumes that companies design directors' and managers' contracts with an optimal incentive to motivate them to improve performance,

thereby maximising shareholder value. It is therefore depicted that higher incentives to directors of companies will lead to performance maximisation.

Stewardship theory has its background in the management control literature (e.g., Davis et al., 1997; Donaldson and Davis, 1991; Lee and O'Neill, 2003). While agency theory argues that separation of incumbency of roles of board chair and CEO lead to the protection of shareholder interests, stewardship theory posits that shareholder interests are maximised by shared incumbency of these roles (Donaldson and Davis, 1991). Stewardship theory suggests that some executives are likely to pursue organisational interests even when there is a conflict with their self-interest (Donaldson and Davis, 1991), which means that executives are more intrinsically motivated than agency theory implies (Wasserman, 2006).

Under the stewardship theory, the use of compensation packages such as bonuses to entice directors and managers in a bid to make them align their interest with that of the shareholders is irrelevant. This is because managers are professional people who know what they are doing and that there is no need to entice them. Moreover, they have their personal ambition to succeed, which should ultimately lead to higher company performance. Managers also have fiduciary roles to the shareholders and duty of loyalty, which Bainbridge (2003 p. 580) argues 'can be understood as one of those voluntarily self-imposed restrictions on the board of director's discretion'. They also see themselves as stewards employed by principals and whose interests tend to be aligned with those of the principals (Wasserman, 2006). Davis et al. (1997) argue that these stewards are organisationally centered executives who show a keen interest in their organisations, and this gives them higher satisfaction from behaviours that promote the organisations' interests than from self-serving behaviours.

Based on the intuitions of the tournament theory, directors of companies must be highly compensated to attract the best people on companies' board, which can bring about performance maximisation. Tournament theory has its roots within the labour economics

literature more than three decades ago (Lazear and Rosen, 1981). The theory suggests that tournament 'participants are best motivated to perform when prizes are not contingent on absolute output but instead are a function of winners and losers' (Conelly et al. 2013 p. 17). Hence, because directors are seen as useful resources, hiring high calibre of directors will ensure high-quality resources, which will enhance performance. The ability of a company to extract both internal and external resources will depend on the calibre of the board of directors. As argued by Daily and Johnson (1997), prestigious directors not only increase companies' legitimacy but also provide links to other prestigious individuals. It is therefore argued under the tournament theory that higher compensation will attract high-quality calibre of directors, which should increase the performance of companies.

3. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

The Cadbury Report (1992) and the Greenbury Report (1995) all failed to prescribe how to determine the directors' remuneration. Rather, both reports prescribe that firms should design a remuneration package that is capable of attracting and retaining executive directors of good calibre. There is a larger literature on directors' remuneration but the majority have concentrated on larger firms rather than SMEs (Main et al. 1996; Ghosh 2003; Gregg et al. 2005; Brick et al. 2006). Arguments for a positive association are that a good compensation package, linked to performance, will entice directors to work hard to increase their remuneration, and will attract the highest-calibre directors with the most-needed specialisation (Jensen and Murphy 1990). Parthasarathy et al. (2006) argue that directors' short- and long-term incentives benefit shareholders by motivating directors to perform better. According to Zhou et al (2011), aligning shareholders' interest with directors' compensation benefits has become one of the main considerations in corporate governance. The supervisory duty of directors also plays an important role in monitoring the behaviour of senior managers (Jensen,

1993; John and Senbet, 1998) and therefore board members should be remunerated in such a way to curb the opportunistic behaviour of senior managers.

One of the first influential articles was by Murphy (1986), in which he indicated a strong relationship between firm performance and directors' remuneration using large publicly held USA firms. Jensen and Murphy (1990) used a sample of larger US firms to investigate the relationship between CEO wealth and shareholder wealth and found little evidence of a relationship between CEO remuneration and performance. Main et al. (1996) and Benito and Conyon (1999) also investigated a sample of UK firms and found a positive relationship between directors' remuneration and firm performance. In Australia, O'Neil and Iob (1999) examined the determinants of remuneration and showed a link between remuneration and performance. A positive association between directors' remuneration and performance was reported by Main et al. (1996), Conyon and Peck (1998), Firth et al. (1999), Ozkan (2007a) and Hassan et al. (2003).

However, high-compensation packages may impair the directors' judgement, giving managers the advantage of being able to pursue their own interests at the expense of performance. Also, higher compensation may lead to the practice of 'mutual back scratching' by directors who collectively propose better packages for each other at the expense of performance (Brick et al. 2006). In this sense, directors may collectively propose higher compensation packages for each other so as to keep all directors happy, but at the expense of company performance. Research by Bricks et al. (2006) found a highly positive association between other directors and CEO remunerations and therefore suggested the presence of mutual back scratching. Even though the general purpose of the board of directors is to advise and monitor top management, Jensen (1993) suggests that the directors often fail to effectively monitor the firms' top management. Well-compensated directors may be less likely to "rock the boat"; meaning excess directors compensation may be associated with a culture that does

not allow for constructive criticism (Brick et al., 2006). Jensen (1993, p. 863) referred to this as "the great emphasis on politeness and courtesy at the expense of truth and frankness in boardrooms."

The effect of higher directors' compensation on company performance is evident in a study by Hassan et al (2003). This study found that even though the level of directors' remuneration showed a steady growth between 1997 and 1998, there was a deteriorating of performance for the same period measured by ROE. Abdullah (2006) and Ozkan (2007) also documented a negative relationship.

This study estimates the optimal directors' remuneration as the equilibrium between the costs and benefits of lower or higher directors' remuneration. Thus, this study investigates two different effects of directors' remuneration on firm performance. Therefore, at lower levels of directors' remuneration, an increase in directors' remuneration level is the sign to increases in firm performance. On the other hand, at higher levels of directors' remuneration, an increase in directors' remuneration is the indication of a reduction in firm performance. Thus, a nonlinear (concave) association is likely to exist between directors' remuneration level and firm performance (see Figure in Appendix 1).

Based on the existing empirical evidence on the relationship between directors' remuneration and firm performance, the following hypotheses are tested by this study:

H_1 there is a concave relationship between *directors'* remuneration and firm performance

H_2 deviation from the optimal directors' remuneration level reduces firm performance

4. SAMPLE, DATA AND METHODOLOGY

4.1 Sample selection and data

The target population of this study was all the firms listed on the Alternative Investment Market (AIM). As at 7th of April 2014, 1,126 firms were listed on the AIM. Financial firms (such as banks and insurance companies) were excluded because they have different accounting requirements and asset structure (see Afrifa and Taurigana, 2015); this left 1,014 firms available for selection. The decision to exclude all financial institutions is consistent with Mangena and Tauringana (2007) and Ntim (2009). Moreover, firm-years with anomalies in their accounts such as negative values in assets, sales, current assets, fixed assets were omitted (see, Abor and Quartey, 2010). Also, firms missing substantial amount of information were excluded. The final sample of SMEs, which is based on the requirements established by the European Commission's Recommendation 2003/361/CE of 6th May 2003, on the definition of SMEs, therefore consists of an unbalanced panel of 802 firms for which information is available. It represents 5,614 firm-year observations. Specifically, the following criteria are used for the selection of SMEs[1][2]:

- Turnover less than €50 million; and
- Possession of less than €43 million of total assets.

[1] The average exchange rate per each year from 2005-2012 was used to convert the total assets and turnover values from British Pounds Sterling to Euro.

[2] **Although the European Commission's Recommendation 2003/361/CE of 6th May 2003 uses the number of employees as a third criteria, we purposefully exclude this third criteria because firms in our sample have data regarding number of employees. Afrifa (2016) also excluded the number of employees in their definition of SMEs in accordance with the European Commission's Recommendation 2003/361/CE of 6th May 2003**.

We use firm-year observations rather than firms, which allows for both entry and exit, and helps to reduce possible selection and survivor bias. The financial and accounting data used in this study were obtained from Analyse Major Databases from European Sources (AMADEUS). This database contains both annual accounts and management details of about 330,000 public and private companies in 41 European countries, including the UK. The reliability of AMADEUS data is evident from its extensive use by other researchers (see, Ahmed, 2015; Rodriguez-Fernandez, 2015). The sample was collected from the AIM because it is one of the few stock exchanges around the world established specifically for SMEs (Mendoza, 2007), and is by far the most successful second-tier market (Colombelli, 2010).

4.2 Variables

The dependent variable to be analysed is Tobin's ratio (QRATIO) defined as the ratio of the firm's market value to the replacement cost of its assets (Martinez-Sola et al., 2013). QRATIO has been used extensively in the accounting and finance literature to measure firm performance (Lin and Su, 2008; Tong, 2008). Following Martinez-Sola et al. (2013), we also include two additional proxies including Market-To-Book ratio 1 (MKBK1) and Market-to-Book ratio 2 (MKBK2) as firm performance to test the robustness of the results. MKBK1 is defined as the ratio of market value of firm (market value of equity plus book value of total debt) to book value of firm (total assets) – as suggested by Chung and Pruitt (1994). MKBK2 is defined as ratio of market value of equity to book value of equity (Martinez-Sola et al., 2013). The key independent variable is directors' remuneration, defined as the natural log of the total remuneration of **all** directors **(including chief executive officers)** for each financial year. Directors' remuneration and its square, directors' remuneration^2 serve to test for the existence of a nonlinear model.

The following control variables are included in all regressions because they have been found by previous literature to explain firm performance (see, Main et al. (1996), Benito and Conyon (1999), Conyon and Peck (1998), Firth et al. (1999), Ozkan (2007a) and Hassan et al. (2003), Scholtz and Smit (2012)). These include company age, company size, asset tangibility, financial leverage ratio, liquidity ratio and short-term financing. All variables are defined in Table 1 below.

[Table 1 about here]

4.3 Methodology

Preliminary data analysis was employed to test for the presence of outliers in the sample. Outliers can be dealt with in two major ways including winsorisation or data removal (Beiner, et al., 2006). In this paper, the decision was made to winsorise all variables at the 1% (see, Hellerstein, 2008). The decision to winsorise all variables are in line with similar procedures by previous researchers in accounting and finance literature (see, Kieschnick et al., 2006; Hill et al., 2010). Also, heteroscedasticity and serial correlation were carried out. The Breusch-Pagan and Breusch-Godfrey tests and the Woodridge test for autocorrelation were used to test for – and suggested the presence of – heteroscedasticity and serial correlation. Therefore, a decision was made to employ robust standard error (Lei, 2006) in estimating all models.

Since panel data regression is used, the Hausman's test is utilised to decide whether to employ the Fixed Effects (FE) model or Random Effect (RE) model by first determining whether there is a correlation between the unobservable heterogeneity (μ_i) of each firm and the explanatory variables of the model. The Hausman test was performed, which rejected the null hypothesis that the unobserved heterogeneity is uncorrelated with the regressors. This finding means that the RE is significantly different from the FE, and therefore the FE is more consistent and efficient method to use. The estimates of the models are as follows:

$$\mathrm{FP}_{\mathrm{it}} = \beta_0 + \beta_1(\mathrm{DREM}) + \beta_2(\mathrm{DREM}^2) + \sum_{\mathrm{K-1}}^{7} \beta_2 \mathrm{CONTROLS}_{\mathrm{it}} + \mu_{\mathrm{i}} + \varepsilon_{\mathrm{it}} \qquad \textbf{(1)}$$

$$\text{DREM}_{it} = \beta_0 + \beta_1(\text{BSIZE}) + \beta_2(\text{CEOTEN}) + \beta_3(\text{NEDS}) + \beta_4(\text{COSIZE}) + \beta_5(\text{INDUST}) + \mu_i + \varepsilon_{it} \quad \textbf{(2)}$$

$$\text{FP}_{it} = \beta_0 + \beta_1(\text{DEVIATION}) + \sum_{K-1}^{7} \beta_2 \text{CONTROLS}_{it} + \mu_i + \varepsilon_{it} \quad \textbf{(3)}$$

$$\text{FP}_{it} = \beta_0 + \beta_1(\text{DEVIATION}) + \beta_2(\text{INTERACT}) + \sum_{K-1}^{7} \beta_3 \text{CONTROLS}_{it} + \mu_i + \varepsilon_{it} \quad \textbf{(4)}$$

We define all variables in Table 1 above. FP is the firm performance (QRATIO, MKBK1 and MKBK2) and the independent variable is directors' remuneration, which measures directors' remuneration by firm i at time t. The subscript i denotes the n^{th} firm (i = 1,... 802) and the subscript t denotes the n^{th} year (t=1,...8). μ_i is the unobservable heterogeneity (individual effects), which is specific for each firm, and ε_{it} is the error term. These four models will assist in achieving the objective of this paper. First, equation (1) will determine whether a concave relationship exists between directors' remuneration and firm performance. The second and third equations will indicate whether a deviation from the optimal directors' remuneration point affect performance. Lastly, the fourth equation will establish the effect of above and below deviations from the optimal directors' remuneration level relationship with firm performance.

4.4 **Endogeneity test**

Many researchers have stated endogeneity as a major issue in the corporate governance literature (Heckman, 1979; Denis, 2001; Adams and Ferreira, 2009; Bellemare et al., 2015). In the presence of endogeneity, the random effects parameter estimates may be biased. One way to overcome endogeneity problems is the use of GMM estimation model; however, in the absence of endogeneity issues the random effects will produce parameter estimates that are more efficient. Potential endogeneity problems arising from omitted explanatory variables, simultaneity bias and measurement errors could blight the results

of this paper (Roberts and Whited, 2013; El Ghoul and Zheng, 2016). In this paper, omitted variables may arise if potential control variables are omitted due to data unavailability (Wooldridge, 2002). Further, simultaneity bias may arise if firm performance and directors' remuneration are determined in equilibrium. That is, performance influencing directors' remuneration Finally, measurement error endogeneity occurs if the main independent variable is incorrectly measured (Larcker and Rusticus, 2010).

To test for the presence of endogeneity, we rely on the Durbin-Wu-Hausman (DHW) test for endogeneity (Durbin, 1954; Wu, 1973; Hausman, 1978) and include block ownership, executive directors' ownership, foreign ownership, non-executive directors and board size as instrumental variables The DHW test has been used extensively in the corporate governance literature to test for the presence of endogeneity (see, Hutchinson et al., 2015; Ntim, 2016; Ahmed et al., 2017; Pillai et al., 2017). The results are presented in Table 4 for all three measures of firm performance. The p-values for all the DHW tests are insignificant, which show that endogeneity is not a significant concern. These findings confirm that the random effects coefficient estimates are reliable and unbiased.

5. EMPIRICAL EVIDENCE

5.1 Descriptive statistics

Table 2 offers descriptive statistics of the continuous variables employed in this paper. The QRATIO has a mean of 1.4923 and a median of 1.5868. The MKBK1 has a mean of 1.7923 and a median of 1.4868. MKBK2 is on average 2.8923 with a median of 1.1868. The differences in the three performance measures above indicate the existence of differences among firm measures of firm performance. The means of the variables MKBK1 and MKBK2 are above the median values, indicating a strong scattering towards the right tail. This means

that some companies' values are much higher than the others. On the other hand, the variable QRATIO has a mean, which is lower than the median value. Directors' remuneration has a mean of approximately £309,483 and a median of £74,031. The average age of the company used in the study is 14.4 years and the median is 9.6 years. Company size has a mean of £4,615,949 and the median is £2,517,000. The mean for asset tangibility is 38.73% and its median is 37.50%. the mean and median for the financial leverage of companies used in the study are 16.255 and 0.03%, respectively. Short-term financing has a mean of 54.89% and a median of 30%. The mean liquidity for the AIM firms selected is 2.4545 with a median of 1.36.

[Table 2 about here]

5.2 Correlation matrix

The results of the Pearson correlation coefficients are presented in **Table 3** for all continuous variables included in the study and indicate a significant and negative correlation between directors' remuneration and QRATIO, MKBK1, and MKBK2 at the 1 per cent level. They also indicate a significant and positive correlation between directors' remuneration and both company age and size at the 1 per cent level. The correlations between the independent variables are also significant. The correlation between MKBK1 and company size is 0.088, significant at the 5 percent level. MKBK2 and asset tangibility have a negative correlation while MKBK2 and liquidity have a positive correlation and both significant at the 5 percent level. Asset tangibility and directors' remuneration also have a correlation coefficient of 0.020, significant at the 1 percent level.

[Table 3 about here]

5.3 Directors' remuneration and firm performance

In order to determine whether an optimum level of directors' remuneration exists we estimate equation (1), where the firm performance in i at time t depends on directors' remuneration and

its square (directors' remuneration^2). The two variables are included to test for the optimal breakpoint of the firm performance-directors' remuneration relationship. To confirm the hypothesis stated above, β_1 and $\beta 2$ must be positive and negative, respectively. As specified above, the study also includes six control variables.

Table 4 shows the results from estimating equation (1) using three different proxies for firm performance. In the first column, the calculation of firm performance is QRATIO. In the second and third columns, MKBK1 and MKBK2 are proxies for firm performance, respectively. Consistent with expectation, directors' remuneration is positive and statistically significant at the 5% or less level for the three proxies of firm performance, while directors' remuneration^2 is negative and significant at the 1% level for the three measures of firm performance. This means that directors' remuneration increases firm performance up to the breakpoint, after which, increases in the directors' remuneration reduces the firm performance. The consistency of the results for all three dependent variables demonstrates the robustness of the findings in relation to the nonlinear relationship between directors' remuneration and firm performance. For the control variables, company age, company size and asset tangibility relate positively to the three proxies of firm performance. The coefficient of leverage is positive but not significant. Liquidity and short-term financing are significant and negatively related to the three proxies of firm performance.

[Table 4 about here]

5.4 Deviation from the optimal *directors' remuneration* level

A concave relationship exists between directors' remuneration and firm performance because of the two contrary effects of directors' remuneration and directors' remuneration^2 on firm performance. Therefore, this section provides evidence to support the motion that firm performance declines if a firm moves away from the optimum directors' remuneration point.

Thus, the study analyses the relation between deviations from optimal directors' remuneration and firm performance. Since a nonlinear directors' remuneration-performance relationship exists, means that there is an optimal point which maximises firm performance, and that deviations from this optimal directors' remuneration level may reduce firm performance. To determine the effect of a deviation from the optimal directors' remuneration level, in equation (1) we eliminate variable directors' remuneration and directors' remuneration^2 and include the residual estimated in the benchmark specification for the determinants of directors' remuneration as explanatory variable, which is similar to that performed by Martinez-Sola et al. (2013).

In order to do this, the study considers equation 2 above as the benchmark specification for the determinants of directors' remuneration. The result from estimating equation (2) is contained in Appendix 2. Now, the residuals from equation (2) are obtained and included in equation (1) after eliminating directors' remuneration and directors' remuneration^2. Therefore, DEVIATION is the absolute value for the residuals. The aim is to determine if deviations from the optimal directors' remuneration level affect firms' performance, using estimation of equation (3). DEVIATION is the main independent variable in this model, defined as the absolute value of residuals of Equation (2). It is expected that $\beta_1 < 0$ in equation (3), to imply a negative relationship between deviations from optimal directors' remuneration and firm performance.

Table 5 contains panel data regression to explain whether deviations from optimum directors' remuneration affect firm performance (equation 3). As expected, the coefficient of DEVIATION is negative and significant at the 5% level or less in all three columns. This demonstrates an inverse relationship between DEVIATION and firm performance. This outcome confirms the existence of a point at which directors' remuneration maximise firm performance and that as firms move away from this point their performance is affected. Once

again, all three alternative measures of firm performance: QRATIO, MKBK1 and MKBK2 show the robustness of the results. However, equation (3) does not determine whether these deviations are positive or negative.

[Table 5 about here]

We now include an interactive term in equation (4) to analyse the way in which both above and below deviations from the optimal directors' remuneration level affect the firm performance. We define the variable INTERACT as above-optimal * DEVIATION. The above-optimal is a dummy variable that takes 1 for positive residuals and 0 otherwise. Therefore, we use estimation equation (4) above. DEVIATION is the main independent variable to be analysed as displayed in Table 6. The main objective is to determine how DEVIATION (coefficient β_1) and DEVIATION + INTERACT (coefficient $\beta_{1+}\beta_2$) affect firm performance. Hence, the expectation is $\beta_1 < 0$ and $\beta_1 + \beta_2 < 0$. The results from Table 6 imply a negative effect of both above-optimal and below-optimal deviations on firm performance. If the residuals are positive, above-optimal variable takes the value 1, and $\beta_1 + \beta_2$ account for effect on firm performance. Otherwise, if residuals are negative, above-optimal variable takes the value 0, which means that INTERACT is 0 and β_1 account for effect.

According to Table 6, DEVIATION is negative and statistically significant under all three measures of firm performance. Also, INTERACT is negatively related to firm performance in all three columns. Here, the interest is the sum of the coefficients $\beta_1 + \beta_2$. For example, in Column 1 the figures for $\beta_1 + \beta_2$ are (–0.944 + (–0.536) = –1.480). These results support H_2, which deviation on either side of the optimal directors' remuneration reduces firm performance. The results are strongly consistent using all three alternative measures of firm performance, and hence a quadratic relationship between directors' remuneration and firm performance is confirmed. Moreover, the findings indicate that any deviations from the optimal directors' remuneration, either above or below significantly reduce firm performance.

[Table 6 about here]

5.5 ***Directors' remuneration and SMEs performan*ce during financial crisis**

The recent financial crisis has renewed the debate about directors' remuneration (Chen et al., 2011). In this section, we examine whether the relationship between directors' remuneration and SMEs performance persisted during the financial crisis of 2007 and 2008. To do this, we create a dummy variable crisis which is equal to one for the period from 2007 to 2008 and zero otherwise. The results presented in Table 7 show that the concave relationship between director remuneration and SMEs performance existed during the financial crisis. However, the coefficients of the interaction variables (DREM*crisis) and $DREM^2$ * crisis) are greater than the coefficients of the variables DREM and $DREM^2$ in. These indicate that the effect of directors' remuneration on SMEs performance is more severe during financial crisis period than normal period. The results show that directors must be motivated to higher performance during financial crisis period and that a lower remuneration will sharply affect performance, given the general decline in firm performance during financial crisis (Aktas et al. (2015).

CONCLUSION

The objective of the study was to investigate the relationship between directors' remuneration and firm performance. The study was based on a panel data regression analysis of 802 SMEs over an eight-year period (2005-2012). First, the study empirically tests for the existence of an optimal directors' remuneration level at which firms' performance is maximised. Second, the paper examines whether deviations from the optimal directors' remuneration level reduce firm performance. The existing research that has investigated the relationship between directors' remuneration and firm profitability has mostly assumed a linear association. Using a non-linear

approach, the results show that an optimum director's remuneration level exist which results from comparing the benefits and costs of director's remuneration.

The results confirm the existence of directors' remuneration level, which maximises firm performance. Deviations from the optimal level reduce firm performance; hence, the establishment of an appropriate remuneration package for directors is of paramount importance to firms. This paper has contributed to knowledge on how directors' remuneration level affects firm performance. While researchers highlight the impact of directors' remuneration on firm performance, this study extends the stream of knowledge by indicating how a deviation from the optimal point influences UK-listed SMEs performance. Moreover, compared with previous literature on directors' remuneration, this paper focuses on AIM-listed SMEs on the London Stock Exchange.

In terms of managerial implications, our finding of a concave relationship between directors' remuneration level and the performance of UK-listed SMEs leads us to recommend that firms, especially SMEs should endeavour to determine the optimal level of directors' remuneration to maximise performance. **One plausible way that SMEs may be able to determine optimal directors' remuneration is to match their remuneration package with those of industry peers that are performing well.** The main limitation of this study is that the above findings are limited to 802 non-financial AIM-listed SMEs that met our criteria. Nevertheless, given that all SMEs that met our criteria were examined over an eight-year period, the results are representative of the test of the relationship between directors' remuneration and performance.

REFERENCES

Abdullah, S. N., 2006. Directors' remuneration, firm's performance and corporate governance in Malaysia among distressed companies. Corporate Governance, 6(2), pp. 162-174.

Abor J., and Quartey, P., 2010. Issues in SME Development in Ghana and South Africa. International Research Journal of Finance and Economics, 39, 218-228.

Adam and D. Ferreira (2009), 'Women in the Boardroom and their Impact on Governance and Performance', Journal of Financial Economics, Vol. 94, No. 2, pp. 291–309.

Afrifa, G. A. (2016). Net working capital, cash flow and performance of UK SMEs. Review of Accounting and Finance, 15(1), 21-44. doi:10.1108/RAF-02-2015-0031

Afrifa, G. A., and Tauringana, V. (2015). Corporate governance and performance of UK listed small and medium enterprises. Corporate Governance: The international journal of business in society, 15(5), 719-733. doi:10.1108/CG-03-2015-0029

Ahmed, A., Monem, R. M., Delaney, D., and Ng, C. (2017). Gender diversity in corporate boards and continuous disclosure: Evidence from Australia. Journal of Contemporary Accounting and Economics, 13(2), 89-107. doi:http://dx.doi.org/10.1016/j.jcae.2017.05.004

Aktas, N., Croci, E., and Petmezas, D. (2015). Is working capital management value-enhancing? Evidence from firm performance and investments. Journal of Corporate Finance, 30, 98-113. doi:http://dx.doi.org/10.1016/j.jcorpfin.2014.12.008Abdullah, H and Valentine, B. (2009). Fundamental and Ethics Thories of Corporate Governance. Middle Eastern Financial and Economics, ISSN: 1450-2889, Issue 4, pp. 88-96

Amess, K. & Drake, L. (2003). Executive Remuneration and Firm Performance: Evidence from a panel of Mutual Organisations. Department of Economics, Leicester University.

Amess. K. and Drake. L. (2003), Executive Remuneration and Firm Performance: Evidence From a Panel of Mutual Organizations, Discussion Papers in Economics, No. 03/13, University of Leicester, Available at: http://www.le.ac.uk/economics/research/RePEc/lec/leecon/dp03-13.pdf?uol_r=d307e306

Bainbridge, S. M. (2003) Director primacy: the means and ends of corporate governance. Northwestern University Law Review, 97(2), pp. 547-606.

Barringer, B. R., Jones, F. F., & Lewis, P. S. (1998). A qualitative study of the management practices of rapid-growth firms and how rapid-growth firms mitigate the managerial capacity problem. Journal of Development Entrepreneurship, 3, pp. 97-122.

Basu, A., Lal, R., Srinivasan, V. and Staelin, R. (1985) Salesforce compensation plans: an agency theoretic perspective. Marketing Science, 4, pp. 267-291.

Beaver, G. and C. Prince (2004) Management, Strategy and Policy in the UK Small Business Sector: A Critical Review, Journal of Small Business and Enterprise Development 11(1), pp. 34-49.

Beiner S., Drobetz W., Schmid M.M. and Zimmermann H. (2006) An Integrated Framework of Corporate Governance and Firm Valuation, European Financial Management, 12 (2), pp. 249-283.

Bellemare, M. F., T. Masaki and T. B. Pepinsky (2015), 'Lagged Explanatory Variables and the Estimation of Causal Effects'. Available at: http://ssrn.com/abstract=2568724.

Benito, A and M. Conyon (1999) The Governance of Directors' Pay from UK Companies, Journal of Management and Governance, 3, pp. 117-136.

Berle, A. and Means, G. (1932) The modern corporation and private property. New York: Macmillan.

Boyd, B. (1994) Board control and CEO compensation. Strategic Management Journal, 15, pp. 335–344.

Brick, I. B., Palmon, O., & Wald, J. K. (2006) CEO Compensation, Director Compensation and Firm Performance: Evidence of Cronyism, Journal of Corporate Finance, 12 (3), pp. 403-423.

Cadbury, A. (1992) The financial aspects of corporate governance. London Gee.

Carlos, A. M. and Nicholas, S. (1996) Theory and History: Seventeenth century Joint-stock Chartered Trading Companies, Journal of Economic History,56 pp. 916-24.

Chen, J. J., Zhang, H., Xiao, X., and Li, W. (2011). Financial crisis and executive remuneration in banking industry – an analysis of five British banks. Applied Financial Economics, 21(23), 1779-1791. doi:10.1080/09603107.2011.587769

Chittithaworn, C. Islam, M. A., Keawchana, T. and Yusuf, D.H.M. (2011) Factors affecting business success of small & medium enterprises (SMEs) in Thailand, Asian Social Science, 7 (5) (2011), p. 180

Chung, K. H and Pruitt, S. W. (1994) A Simple Approximation of Tobin's q. Financial Management, 23(3), pp. 70-74.

Colombelli, A. (2010) Alternative Investment Market: a way to promote entrepreneurship, Journal of Industry, Competition and Trade 10(3), pp. 253-274.

Connelly, B. L., Tihanyi, L., Crook, T. R. and Gangloff, K. A. (2013) Tournament theory: thirty years of contests and competitions. Journal of Management, 40(1), pp. 16-47.

Conyon, M. J. and Peck, S. I. (1998) Board control, remuneration committees, and top management compensation. Academy of Management Journal, 41 (2) pp. 146-157.

Cook P. and Nixon, F. (2000) Finance and Medium- Sized Enterprise Development, IDPM, University of Manchester, Finance and Development Research Programme, Working Paper No 14, https://pdfs.semanticscholar.org/a680/ffdf7dd6c3f64b708ad2c415d24f4c075e35.pdf.

Daily, C. M. and Johnson, J. L. (1997) Sources of CEO power and firm financial performance: A longitudinal assessment. Journal of Management, 23, pp. 97-117.

Dalton, D., Daily, C., Certo, T., & Roengpitya, R. (2003) Metaanalyses of financial performance and equity: Fusion or confusion? Academy of Management Journal, 46, pp. 13-26.

Davis, J. H., Schoorman, F. D., and Donaldson, L. (1997) Toward a stewardship theory of management. Academy of Management Review, 22, pp. 20-47.

Deloof, M. (2003) Does working capital management affect profitability of Belgian firms? Journal of Business Finance & Accounting, 30 (3/4), pp. 573-587.

Demski, J. and Feltham, G. (1978) Economic incentives in budgetary control systems. Accounting Review, 53, pp. 336-359.

Denis, D. (2001), 'Twenty-five years of Corporate Governance Research and Counting', Review of Financial Economics, **10**, 191-212.

Department for Business Innovation and Skills (2011) Business population estimates for the UK and regions.

Donaldson, L. and Davis, J. H. (1991) Stewardship theory or agency theory: CEO governance and shareholder re turns. Australian Journal of Management, 16(1), pp. 49-64.

Doucouliagos, H., Haman, J., Askary, S. (2007) Director's Remuneration and Performance in Australian Banking, Corporate Governance, 15(6) pp. 1363-1383.

Durbin J (1954) Errors in variables. Review of the International Statistical Institute 22: 23–32.

Eccles, R. (1985) Transfer pricing as a problem of agency. In J. Pratt and R. Zeckhauser (Eds.), Principals and agents: The structure of business (pp. 151-186). Boston: Harvard Business School Press.

Eisenhardt, K. (1985) Control: organizational and economic approaches. Management Science, 31, pp. 134-149.

Eisenhardt, K. (1988) Agency and institutional explanations of compensation in retail sales. Academy of Management Journal, 31, pp. 488-511.

Eisenhardt, K.M. (1989) Agency theory: an assessment and review, The Academy of Management Review, 14(1), pp. 57-74.

El Ghoul, S. and X. Zheng (2016). "Trade credit provision and national culture." Journal of Corporate Finance 41: 475-501.

Elson, C. (1995) Director compensation and the management captured board—the history of a symptom and a cure. Southern Methodist Law Review, 50 (September/October): pp. 127–174.

Fama, E. (1980) Agency problems and the theory of the firm. Journal of Political Economy, 88, pp. 288-307.

Fama, E. and Jensen, M. (1983) Separation of ownership and control. Journal of Law and Economics, 26, pp. 301-325.

Fazzari, Steven M., and Bruce C. Petersen, (1993) Working capital and fixed investment: new evidence on finance constraints, RAND Journal of Economics, 24, pp. 328–342.

Firth, M., Tam, M., and Tang, M. (1999) The determinants of top management pay. Omega, 27(6), pp. 617-35.

García-Teruel, P.J. and Martínez-Solano, P. (2007) Effects of working capital management on SME profitability. International Journal of Managerial Finance, 3 (2), pp. 164-177.

Ghosh, A. (2003) Board structure, executive compensation and firm performance in emerging economies: evidence from India. Indira Gandhi Institute of Development Research.

Goering, G.E. (1996) Managerial style and the strategic choice of executive incentives. Managerial and Decision Economics, 17, pp. 71–82.

Greenbury, Sir Richard (1995) Directors' remuneration. Report of study group chaired by Sir Richard Greenbury (the Greenbury Report), Gee Publishing Ltd.: London, UK.

Gregg, P., Jewell, S., and Tonks, I. (2005) Executive Pay and Performance in the UK 1994 - 2002, working paper, XFi Centre for Finance and Investment.

Gregg, P., Jewell, S. and Tonks, I. (2012), Executive Pay and Performance: Did Bankers' Bonuses Cause the Crisis?. International Review Finance, 12(1) pp. 89–122. doi:10.1111/j.1468-2443.2011.01136.x

Grundy, B. D. and Li, H. (2010) Investor sentiment, executive compensation and corporate investment. Journal of Banking and Finance, 34, pp. 2439-2449.

Hassan, S., Christopher, T., and Evans, R. (2003) Directors' remuneration and firm performance: Malaysian evidence. Malaysian Accounting Review, 2(1), pp. 57-67.

Hausman J. A. (1978) Specification tests in econometrics. Econometrical. 46, pp. 1251-1271.

Heckman, J. J. (1979) Sample selection bias as a specification error. Econometrica, 47(1), pp. 153–61.

Hellerstein, J. M. (2008) Quantitative Data Cleaning for Large Databases. EECS Computer Science Division UC Berkeley. Available from: http://db.cs.berkeley.edu/jmh

Hill, M. D., Kelly, G. W. and Highfield, M. J. (2010) Net operating working capital behavior: a first look. Financial Management, 39(2), pp. 1-44.

Hillman, A. J. and Dalziel, T. (2003) Boards of directors and firm performance: integrating agency and resource dependence perspectives. The Academy of Management Review, 28(3), pp. 383-396.

Hillman, A. J., Cannella, A. A. and Paetzold, R. L. (2000) The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. Journal of Management Studies, 37, pp. 235-255.

Hutchinson J. and Xavier A. (2006) Comparing the impact of credit constraints on the growth of SMEs in a transition country with an established market economy. Small Business Economics, 27(1), pp. 169-179.

Hutchinson, M., Seamer, M., and Chapple, L. (2015) Institutional Investors, Risk/Performance and Corporate Governance. The International Journal of Accounting, 50(1), 31-52. doi:http://dx.doi.org/10.1016/j.intacc.2014.12.004

Jensen, M. and Meckling, W. (1976) Theory of the firm: Managerial behavior, agency costs, and ownership structure. Journal of Financial Economics, 3, pp. 305-360.

Jensen, M., (1993) The modern industrial revolution, exit and the failure of internal control systems. Journal of Finance, 48, pp. 831-880.

Jensen, M. and Murphy, K. (1990) Performance pay and top management incentives, Journal of Political Economy, 98, pp. 225-263.

John, K. and Senbet L. W. (1998) Corporate governance and board effectiveness. Journal of Banking and Finance, 22, pp. 371-403.

Kieschnick R., La Plante, M., and Moussawi, R. (2006) Corporate Working Capital Management: Determinants and Consequences. Working Paper. The Wharton School.

Kosnik, R. (1987) Greenmail: a study in board performance in corporate governance. Administrative Science Quarterly, 32, pp. 163-185.

Lader, P. (1996) The Public/Private Partnership. Springs Spring, 35(2), pp. 41-44.

Larcker D. F. and Rusticus, T. O. (2010) On the use of instrumental variables in accounting research. Journal of Accounting and Economics 49(3): 186–205.

Lazear E. P. (1998) Personnel economics for managers. New York: John Wiley.

Lee, P. M. and O'Neill, H. M. (2003) Ownership structures and R&D investments of US and Japanese firms: agency and stewardship perspectives. Academy of Management Journal, 46, pp. 212-225.

Lei, Z. (2006) Measuring Regional Economic Effects of Low-cost Carriers in the UK: A Panel Data Econometric Approach. Thesis (PhD). University of Surrey School of Management.

Lin, C. and Su, D. (2008) Industrial diversification, partial privatization and firm valuation: evidence from publicly listed firms in China. Journal of Corporate Finance, 14, pp. 405-417.

Lukacs, E. (2005) The economic role of SMEs in world economy, especially in Europe. European Integration Studies, Miskolc, 4(1), pp. 3-12.

Main, B. G. M., Bruce, A., and Buck, T. (1996) Total board remuneration and company performance. The Economic Journal, 106(439), pp. 1627-44.

Mangena, M. and Tauringana, V. (2007) Disclousure, Corporate Governance and Foreign Share Ownership on Zimbabwe Stock Exchange. Journal of International Financial Management and Accounting, 18(2), pp. 53–85.

Martínez Sola, C., García-Teruel P. J., and Martínez Solano, P. (2013) Trade credit policy and firm value. Accounting & Finance, 53(3), pp. 791-808.

Mendoza, J. M. (2007) Securities regulation in low tier listing venues: the rise of the alternative investments market, Working paper, Javeriana University.

Miller, D. and Sardais, C. (2011) Angel Agents: agency theory reconsidered. The Academy of Management Perspectives (formerly The Academy of Management Executive). 25, pp. 6-13.

Mitnick, B. (1986) The theory of agency and organizational analysis. Unpublished working paper, University of Pittsburgh.

Mizruchi, M. S. (1983) Who controls whom? An examination of the relation between management and board of directors in large American corporations. Academy of Management Review, 8, pp. 426-435.

Murphy K. J. (1985) Corporate performance pay and managerial remuneration: an empirical analysis, Journal of Accounting and Economics, 7, pp. 11–42.

Murphy, K. J. (1986) Incentives, learning, and compensation: a theoretical and empirical investigation of managerial labor contracts, Rand Journal of Economics, 17(1), pp. 59-76.

Murphy, K. J. (1997) Executive Compensation and the Modern Industrial Revolution. International Journal of Industrial Organization, 15(4), pp. 417-426.

Murphy, K. J. (1999). "Executive Compensation", in Handbook of Labor Economics, eds. O. Ashenfelter and D. Card, North-Holland, Volume 3B.

Newberry, D. (2006) The Role of Small and Medium-Sized Enterprises in the Futures of Emerging Economies. Available from: http://earthtrends.wri.org/features/view

Ntim, C. G. (2009) Internal corporate governance structures and firm financial performance: evidence from South African listed firms. Thesis, (PhD). University of Glasgow.

Ntim, C. G. (2016). Corporate governance, corporate health accounting, and firm value: The case of HIV/AIDS disclosures in Sub-Saharan Africa. The International Journal of Accounting, 51(2), 155-216. doi:http://dx.doi.org/10.1016/j.intacc.2016.04.006

O'Neil, G. L. and Iob, M. (1999) Determinants of executive remuneration in Australian organizations: An exploratory study. Asia Pacific Journal of Human Resources, 37(1), pp. 35-75.

Ozkan, N. (2007a) Do corporate governance mechanisms influence CEO compensation? An empirical investigation of UK companies. Journal of Multinational Financial Management, 17(5), pp. 349-64.

Ozkan, N. (2007b) CEO Pay-for-Performance Sensitivity and Corporate Governance: An Empirical Investigation of UK Panel Data, 2007 FMA. Financial Management Association. Annual Meeting. Available from: http://69.175.2.130/~finman/Orlando/Papers/Neslihan.pdf

Parker, R., Riopelle, R., and Steel, W. (1995). Small Enterprises Adjusting to Liberalisation in Five African Countries. World Bank Discussion Paper, No 271, African Technical Department Series. The World Bank: Washington DC.

Petersen, M. A., and Rajan, R. G. (1997) Trade Credit: Theories and Evidence. The Review of Financial Studies, 10(3), pp. 661-691.

Pillai, R., and Al-Malkawi, H.-A. N. (2017). On the relationship between corporate governance and firm performance: Evidence from GCC countries. Research in International Business and Finance. doi:http://dx.doi.org/10.1016/j.ribaf.2017.07.110

Roberts, M. R. and T. M. Whited (2013). Chapter 7 - Endogeneity in Empirical Corporate Finance1. Handbook of the Economics of Finance. M. H. a. R. M. S. George M. Constantinides, Elsevier. Volume 2, Part A: 493-572.

Rodriguez-Fernandez, M. (2015) Company financial performance. Does board size matter? Case of the EUROSTOXX50 index Cuad. Gest., 15 (2), pp. 15–38.

Ross, S. A. (1973) The economic theory of agency: the principal's problem', American Economic Review, 63(2), pp. 134-39.

Scholtz, H. E. and Smit, A. (2012) Executive remuneration and company performance for South African companies listed on the Alternative Exchange (AltX). Southern African Business Review, 16(1), pp. 22–38.

Smith, C. W and Watts, R. L. (1992) The investment opportunity set and corporate financing, dividend, and compensation policies. Journal of Financial Economics, Volume 32, Issue 3, pp. 263–292.

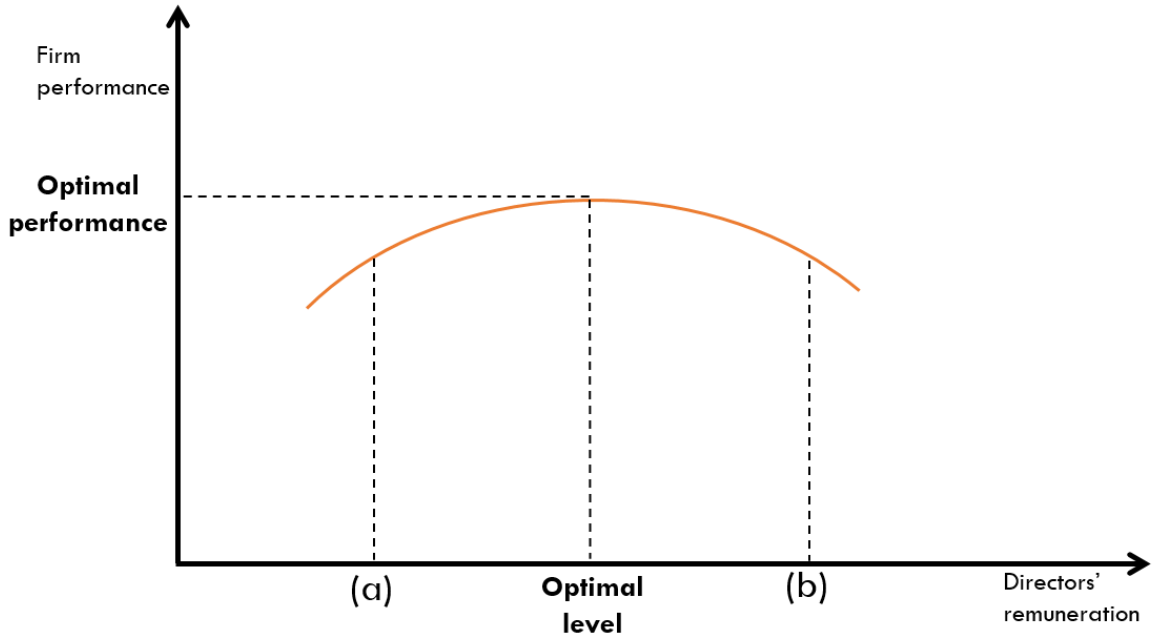
Spence, A. M. and Zeckhauser, R. (1971) Insurance, information, and individual action. American Economic Review, 61, pp. 380-387.

Stathopoulos, K., Espenlaub, S. and Walker, M. (2004) U.K. executive compensation practices: new economy versus old economy. Journal of Management Accounting Research, 16(1), pp. 57-92.

Wan, T. W. D., Ong, C. H., and Pong, P. K. T. (2001) Directors' remuneration and profitability performance of listed companies in Singapore: a correlation and causality study. Faculty of Business Administration, National University of Singapore.
Wasserman, N. (2006) Stewards, agents, and the founder discount: Executive compensation in new ventures. Academy of Management Journal, 49(5), pp. 960-976.
White, H. (1985) Agency as control. In J. Pratt and R. Zeckhauser (Eds.), Principals and agents: The structure of business (pp. 187-214). Boston: Harvard Business School Press.
Whited, T. M. (1992) Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data, Journal of Finance, 47(4), pp. 1425-60
Wooldridge, J. M. (2002), Econometric Analysis of Cross Section and Panel Data (Cambridge, MA: MIT Press).
Wu D (1973) Alternative tests of independence between stochastic regressors and disturbances. Econometrica 41, pp. 733–750.
Zajac, E. J., and Westphal, J. D. (1996) Director reputation, CEO-board power, and board interlocks. Administrative Science Quarterly, 41, 507-529.
Zhou, W., Georgakopoulos, G., Sotiropoulos, I., and Vasileiou, K. Z. (2011). The impact of executive payment on firm performance of financial enterprises in China. Asian Social Science, 7(8), 65-80.

Appendix 1

Figure 1: Concave association between directors' remuneration level and firm performance



Appendix 2

Antecedents of Directors Remuneration

Variables	DIRECTORS' REMUNERATION
BSIZE	0.326(2.87)***
CEOTEN	0.015(3.01)***
NEDS	−0.002(2.82)***
COSIZE	0.157(2.96)***
INDUST	Included
Number	4,660
Adjusted R^2	38.913
Constant	9.681(0.234)***
Notes: Coefficients are in front of parentheses. ***Significant at 0.01 level. t−statistics are in parentheses. The dependent variable is directors' remuneration.	

Table 1: Summary of Variables Calculations and definitions

Variables	Acronym	Measurement
Tobin's Q ratio	QRATIO	The ratio of the firm's market value to the replacement cost of its assets
Market-To-Book ratio 1	MKBK1	The ratio of market value of firm (market value of equity plus book value of total debt) to book value of firm (total assets)
Market-to-Book ratio 2	MKBK2	The ratio of market value of equity to book value of equity
Remuneration of directors	DIRECTORS' REMUNERATION	Natural log of the total remuneration of directors for each financial year
Square of Remuneration of directors	DIRECTORS' REMUNERATION^2	Remuneration of directors multiplied by Remuneration of directors
Company age	COAGE	Number of years between incorporation and the calendar year end of each firm
Company size	COSIZE	The natural log of firm's turnover at the end of the financial year
Financial Leverage	LEV	Ratio of total debt divided by capital at the end of the financial year
Assets tangibility	ATAN	The ratio of fixed assets divided by total assets at the end of the financial year
Liquidity Ratio	LIQ	Current assets divided by current liabilities at the end of the financial year
Short−term financing	SFIN	Current liabilities divided by total assets at the end of the financial year
Industry dummy	INDUST	A dummy variable for each of the six industries: construction and mining, software and communications, food and pharmaceuticals, support services, household and personal goods and electronic and electrical equipment
Non-executive directors	**NEDS**	**Number of years the CEO has been in post at the end of each financial year**

Board size	**BSIZE**	**Total number of all directors on the board at the end of the financial year**
CEO tenure	**CEOTEN**	**Number of years the CEO has been in post at the end of each financial year**
Deviation	**DEVIATION**	**DEVIATION is measured as the absolute value for the residuals after running regressions where the dependent variable is directors remuneration.**

Table 2: Summary Descriptive Statistics of all Continuous Variables

Variable	Obs	Mean	Std. Dev.	Median	Perc 10	Perc 90
QRATIO	5,614	1.4923	1.3496	1.5868	0.5756	7.3636
MKBK1	5,614	1.7923	3.3846	1.4868	0.5243	6.2636
MKBK2	5,614	2.8923	8.2053	1.1868	0.8243	5.9636
DREM	5,614	309, 482.53	335,982.531	74,031.254	11,621.576	687,737.778
COAGE	5,614	14.4103	15.0944	9.6383	2.8191	28.1233
COSIZE	5,614	4615.949	5842.694	2517.00	344.50	13500
ATAN	5,128	0.3873	.2780442	0.3750	0.0100	0.7900
LEV	4,882	16.2554	35.81185	0.0300	0.0000	56.0500
LIQ	4,726	2.454583	3.192115	1.3600	0.1300	6.6800
SFIN	4,758	.5489097	0.756336	0.3000	0.0400	0.9100

Notes: Variables are defined in Table 1.

Table 3: Correlation matrix

	QRATIO	MKBK1	MKBK2	DREM	COAGE	COSIZE	ATAN	LEV	LIQ	SFIN
QRATIO	1.000									
MKBK1	0.553***	1.000								
MKBK2	0.445***	0.684***	1.000							
DREM	−0.036***	−0.007***	−0.030***	1.000						
COAGE	0.171***	0.160***	0.103***	0.043***	1.000					
COSIZE	0.148***	0.088**	−0.014***	0.336***	0.181***	1.000				
ATAN	−0.036**	−0.013**	−0.009**	0.020**	−0.070**	0.109***	1.000			
LEV	0.008	−0.273	−0.201	0.058*	0.074**	0.239***	0.180***	1.000		
LIQ	−0.146***	−0.032	0.068**	−0.028	−0.053*	−0.206***	−0.238***	−0.232***	1.0000	
SFIN	0.015	−0.004	−0.097***	0.022	0.084***	0.252***	−0.002	0.113***	−0.468***	1.000

Table 4: Directors' Remuneration and Firm Performance

VARIABLES	QRATIO	MKBK1	MKBK2
DREM	1.587(2.07)**	3.742(2.75)**	2.683(3.99)***
$DREM^2$	−0.196(−4.50)***	−0.371(−2.86)***	−0.233(−3.28)***
COAGE	0.228(8.64)***	0.609(5.64)***	0.405(4.41)***
COSIZE	1.226(2.95)***	3.615(6.26)***	0.672(1.82)*
ATAN	7.616(2.54)**	3.310(2.59)**	5.761(1.86)*
LEV	−0.033(−0.31)	−0.538(−0.39)	−0.270(−0.93)
LIQ	−1.732(−3.57)***	−2.192(−3.14)***	0.146(2.67)**
SFIN	−7.768(−3.68)***	−8.906(−3.64)***	−12.112(−4.16)***
Adjusted R^2	31.040	31.066	38.406
Hausman test	0.000	0.000	0.00
DWH Test Statistic	**2.18636**	**1.64723**	**1.54343**
P−Value	**0.1129**	**0.1931**	**0.2230**
Number	4,660	4,660	4,660
Constant	−5.805(−5.06)***	−29.731(−5.27)***	−17.475(−5.43)***

Notes: Coefficients are in front of parentheses. ***Significant at 0.01 level; **Significant at 0.05 level; *Significant at 0.10 level, t−statistics are in parentheses.

Table 5: Deviation from the optimal Directors' Remuneration and Firm Performance (I)

VARIABLES	QRATIO	MKBK1	MKBK2
Deviation	−1.025(−3.04)***	−1.237(−10.44)***	−0.174(−2.19)**
COAGE	0.235(8.41)***	0.620(5.50)***	0.411(4.27)***
COSIZE	0.833(2.20)**	3.019(7.99)***	0.357(2.67)**
ATAN	7.117(−2.33)**	4.242(3.73)***	6.389(3.28)***
LEV	−0.032(−1.23)	−0.537(−1.18)	−0.269(−1.06)
LIQ	−1.691(−3.45)***	−2.119(−2.95)***	0.191(0.80)
SFIN	−7.124(−3.29)***	−7.880(−3.10)***	−11.529(−4.34)***
Adjusted R^2	31.01	24.58	31.08
Number	4,660	4,660	4,660
Constant	−14.065(−5.60)***	−37.256(−8.00)***	−18.559(−4.09)***
Notes: Coefficients are in front of parentheses. ***Significant at 0.01 level; **Significant at 0.05 level, t−statistics are in parentheses.			

Table 6: Deviation from the optimal Directors' Remuneration and Firm Performance (II)

VARIABLES	QRATIO	MKBK1	MKBK2
Deviation	−0.944(−2.08)**	−1.550(−2.12)**	−0.886(−2.76)**
Interact	−0.536(−2.37)**	−2.063(3.56)***	−4.697(2.09)**
COAGE	0.235(8.13)***	0.618(5.39)***	0.406(4.19)***
COSIZE	0.793(5.77)***	3.172(5.51)***	0.705(4.21)***
ATAN	7.161(−2.34)**	4.411(−10.51)***	6.773(8.98)***
LEV	−0.032(−1.26)	−0.536(0.79)	−0.267(−1.28)
LIQ	−1.688(−3.40)***	−2.130(−2.98)***	0.168(0.69)
SFIN	−7.110(−3.26)***	−7.936(−3.10)***	−11.656(−4.25)***
Adjusted R^2	31.34	31.27	24.73
Number	4,660	4,660	4,660
Constant	−13.648(−6.22)***	−38.857(−8.52)***	−22.201(−4.80)***

Notes: Coefficients are in front of parentheses. ***Significant at 0.01 level; **Significant at 0.05 level, t−statistics are in parentheses.

Table 7: Directors' remuneration and Firm Performance during financial crisis

VARIABLES	QRATIO	MKBK1	MKBK2
DREM	0.168(2.22)**	0.178(2.31)**	1.831(2.39)**
$DREM^2$	−0.117(−1.78)*	−0.176(−2.24)**	−0.192(−2.67)**
DREM*crisis	3.405(2.26)**	8.926(2.48)**	4.202(2.36)**
$DREM^2$ *crisis	−0.203(−2.09)**	−0.501(−2.89)***	−0.372(−2.32)**
COAGE	0.2283(8.76)***	0.607(5.68)***	0.405(4.44)***
COSIZE	1.231(3.04)***	3.634(6.29)***	2.672(4.03)***
ATAN	7.303(2.39)**	6.166(2.18)**	6.271(2.25)**
LEV	−0.233(−8.35)***	−0.540(−10.29)***	−0.271(−8.68)***
LIQ	−1.718(−3.64)***	−2.170(−3.15)***	−1.152(−2.89)***
SFIN	−7.665(−3.76)***	−8.630(−3.37)***	−12.078(−3.96)***
Crisis	−13.4768(−2.75)***	−15.781(−3.24)***	−18.016(−3.37)***
Adjusted R^2	0.3111	0.3087	0.2429
Number	4,660	4,660	4,660
Constant	−10.291(4.09)***	−13.558(−4.37)***	−9.347(−4.19)***
Notes: Coefficients are in front of parentheses. ***Significant at 0.01 level; **Significant at 0.05 level, t−statistics are in parentheses.			