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Executive Compensation, Capital Structure, Payouts and Cash Holding: Evidence of UK Panel Data

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Copyright Declaration

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Abstract

The aim of this research is to examine the relationship between CEO pay and firm's financial policies. According to agency theory, manager-shareholder conflicts of interest can be alleviated (and managerial compensation can be influenced) by debt. Debt lowers the level of free cash flow which managers are able to obtain because monitoring increases. This means that when the risk of bankruptcy appears, managers must consider the best financial interests of shareholders. Under agency theory, pay-performance sensitivity is smaller for high-debt companies when alternatives are available for high alignment incentives and high debt.

The research objectives focus on three empirical chapters to explore the association between CEO pay and firm's financial policies for UK firms. The first study investigates the relationship between pay-performance sensitivity and debt as the explanatory variables. In the second study, the link between CEO compensation and corporate payout policy by segregating between total payouts, dividends and share repurchases are explored. Finally, the last objective examines the interaction between CEO pay packages and cash holdings of the firm.

The research sample consists of 183 publicly traded companies listed on the FTSE 350 from 1999 to 2008. The estimates in the pay-performance study show mixed support for pay-performance and leverage because the negative coefficients for market debt have weak significance overall when median regressions are employed. Thus, it can be concluded that a firm's leverage has little effect on pay-performance sensitivity as a mechanism to align the interests of the firm's CEO and debt holders. However, there is strong support for the hypothesis that CEO pay-performance sensitivity increases with a firm's growth opportunities, which suggests that firms award higher equity compensation to attract managers with more talent.

The second study in this research investigates how corporate payout policy is influenced by CEO share ownership, CEO stock options and CEO long-term incentive plans (LTIPs) in UK firms from 1999 to 2008 using Tobit regressions (for total payouts, dividends and share repurchases) and logistic regressions for the propensity of firms paying out to shareholders . The results show that CEO share

ownership LTIPs have positive effects on corporate payout policy. In contrast, corporate governance characteristics do not show conclusive results which affect changes in payout policy. Dividend payout is significantly influenced by CEO share ownership compared to share repurchase payout. The findings support the notion that CEOs' share equity ownership is used to align managerial interest with shareholders in terms of cash payouts to shareholders.

In the final empirical chapter, the study focuses on the effect of CEO pay and corporate governance on cash holdings. The study investigates the determinants of cash holdings based on free cash flow and the agency model using cash ratios (cash to sales, cash to assets, cash to market value and log of cash) as dependent variables The analysis documents that CEO ownership and log LTIPs both have positive and strong relationships with cash ratios. The results support the hypothesis that equity compensation can be used to align managers' interests with those of shareholders.

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Chapter 1: Introduction

It is established among finance scholars that managers tend to pursue their own interests with minimal effort instead of focusing on shareholders' wealth maximising activities. In order to align managers' and shareholders' interests, the managerial compensation contract is designed to provide an incentive for managers to reduce moral hazard and increase shareholders' value (Holmstrom, 1979). Executive compensation is an area which has been the target of public ire because of a number of scandals and generous severance packages to high profile corporate executives during the financial crisis of 2007 to 2012. Despite shareholders' desire to reduce the conflicts in order to regain control when managers run firms, the public still criticises these efforts because executives continue to receive what is deemed to be excessive compensation at a time when firm performance and share price have declined (Chen et al., 2010; Wang et al., 2011).

Literature on executive compensation can be classified into two groups. The first group focuses on the pay-performance relationship as shown in several studies (e.g. Jensen and Murphy, 1990; Aggarwal and Samwick, 1999; Core and Guay, 1999; Conyon and Sandler, 2001; Ortiz-Mollina, 2006). Such pay-performance studies concentrate on the sensitivity between firm performance and CEO compensation (salary, bonus, stock options etc.). The premise behind these studies is that in order to reduce the agency conflicts between managers and shareholders, CEO compensation packages should be designed to alleviate the problems (Murphy, 1999). However, Bebchuk and Fried (2002) argue that executive compensation

packages encourage self-serving behaviour among top management when there are weak boards of directors or strong managerial entrenchment problems.

The second type of study on executive compensation focuses on how CEO compensation influences managerial behaviour and decision-making. These studies examine how pay affects top managers' payout policies (e.g. Lambert et al., 1989; Fluck, 1999; Fenn and Liang, 2001), risk preferences (Guay, 1999; Hall and Murphy; 2002; Low, 2009), cash holdings (e.g. Bates et al., 2009) and earnings manipulation (e.g. Bergstresser and Philluppon, 2006). These studies often suggest that CEO compensation may not be producing the incentive alignment effect expected by shareholders.

However, the UK has experienced considerable corporate governance reform since the late 1990s. The publication of the Greenbury Report and the Combined Code (1998, 2003, 2006 and 2010) provide extensive guidance for good practices regarding directors' remuneration and disclosure. The UK Corporate Governance Code (2010) states that:

"Levels of remuneration should be sufficient to attract, retain, and motivate directors of the quality required to run the company successfully, but a company should avoid paying more than necessary for this purpose. A significant proportion of executive directors' remuneration should be structured so as to link rewards to corporate and individual performances" (Main Principle, D.1).

Further, improved directors' remuneration disclosure in the UK has attracted a number of studies on CEO compensation in the UK in terms of pay comparison (e.g. Conyon and Murphy, 2000), managerial opportunistic behaviour (e.g. Kuang, 2008), and pay-performance (e.g. Ozkan, 2011). This thesis attempts to add to the

literature on CEO pay for UK firms.

1.1 Motivation for the Research and Contributions

The main objective of this thesis is to investigate pay-performance sensitivity in UK firms and examine how CEO compensation and corporate governance influence firms' financial policies. This study extends the works of Zwiebel (1996) and Morellec (2004) by looking at the agency model through managerial perspective where incentives are deployed to mitigate the agency conflicts by increasing the incentive alignment. The findings lend support for Zwiebel (1996) proposition that debt structure and managerial shareholding will limit managerial tendencies to abuse power by restricting available cash reserves. Using Morellec (2004) model, this study is able to distinguish the type of incentives (share options and LTIPs) influence the payouts policy of the firm. This objective contributes to existing literature which focuses on short-term and long-term incentives. By analysing UK CEO compensation data, I have been able to extract meaningful findings on the effects of cash and equity compensation on payout and cash holding policies.

This research investigates three objectives on the incentive alignment and corporate financial policies. Firstly, the link between pay-performance sensitivity and debt is explored. Secondly, how the CEO compensation influences the payouts of the firm is examined by looking at the total payouts, dividends and share repurchases, and propensity for payouts. Thirdly, the association between CEO pay and corporate cash holdings is examined by looking at different cash ratios (cash to sales, cash to assets, cash to market value) and log of cash.

The main findings for the empirical studies are as follows. First, this research uses the measurement of pay-performance sensitivity not only on stock options but also on long-term incentive plans (LTIPs) and total cash and equity pay. A few studies consider the relationship between CEO pay and debt structure (e.g. Ortiz-Mollina, 2006; Billet, Mauerand Zhang, 2010). However, these studies do not explore the effects of overall pay components with corporate governance variables. While agency problems could exist between managers and shareholders, it is also vital to look at the agency conflicts between shareholders and debt holders and to examine how pay-performance sensitivity is affected by debt and corporate governance mechanisms. By looking at firm pay-performance sensitivity, I am able to document strong support for the hypothesis that CEO pay-performance sensitivity increases with firms' growth opportunities, which suggests that firms award higher equity compensation to attract managers with more talent. However, the other estimates show mixed support for pay-performance and leverage because the negative coefficients for market debt have overall weak significance.

Secondly, this study explores the link between CEO pay and corporate payout policy. Finance literature has examined many aspects of what influences corporate payout decisions. Early research shows that the degree of alignment of interest between managers and shareholders affects payout policy. A better alignment of interest could curb overinvestment or underinvestment problems; thus, the need for regular payouts to mitigate agency conflicts could decline as alignment increases. Several studies find support for this hypothesis and document a negative association between managerial shareholding and dividends (Rozeff, 1982; Eckbo and Verma, 1994). This study uses specific CEO pay structures in a UK setting and does not only

focus on managerial ownership as per prior studies (e.g. Fenn and Liang, 2001; Bates et al., 2009).

This study further explores the relationship between CEO pay and cash holding. Compared with prior studies on cash holding, the chapter in this study on CEO pay and cash holding also uses cash assets scaled to market value and not just to sales and total assets (e.g. Opler et al., 1999; Song and Lee, 2012). This approach sheds more light on the nature of cash holding in a firm. By combining this with corporate governance mechanisms, the extent to which CEO equity incentives and corporate governance mechanisms influence cash holding policies produces significant results which add to the literature. This study finds that managerial shareholding has positive and significant results for the level of cash holding as a proxy for the proportion of cash to total non-cash assets. This is similar to findings by Harford et al., (2008). However, other cash holding variables (cash to sales, cash to market value and log of cash) produce inconclusive results. As expected, corporate governance variables show strong and positive results on the level of cash holdings in the sample firms. The findings support the hypothesis that a high level of insider directors will result in a high level of cash holdings because of a slackening of monitoring by executive directors.

Finally, in order to conduct the empirical investigations, this study employs sophisticated panel data regressions which help control for the endogeneity problems. These can arise from reverse causality or unobserved heterogeneity. By comparing the fixed effects and pooled OLS regressions, these two methods provide more accurate and robust empirical results.

This study uses a uniquely constructed dataset which includes detailed

information on the CEO compensation structures and board structures of a sample of UK listed companies. Previously, UK boards of directors have been generally considered as corporate devices which provide a weak disciplinary function because of weak powers which enforce monitoring responsibilities on directors (Ozkan, 2007). However, the recent development in tighter corporate governance guidelines provides an interesting discussion on executive compensation and corporate governance issues. When executive compensation is viewed as a mechanism to induce alignment with shareholders, corporate governance mechanisms serve in conjunction with it to provide monitoring and disciplining of top management.

1.2 Major Findings

This section provides an overview of the major findings of the research.

1.2.1 Pay-Performance Sensitivity and Leverage

In Chapter 4, the aim is to examine the relationship between CEOs' pay-performance sensitivity and firms' capital structure as the explanatory variable. The estimates show mixed support for pay-performance and leverage because the negative coefficients for market debt have overall weak significance. Using median regression, the results however show that firm risk is found to be negatively related to pay-performance sensitivity. This weakly supports the hypothesis that firms' leverage has influence on pay-performance sensitivity as a mechanism to align the interests of CEOs and debt holders of firms.

It can be concluded that firms' leverage has little effect on pay-performance sensitivity as a mechanism to align the interests of CEOs and debt holders of firms. Further, there is strong support for the hypothesis that CEO pay-performance

sensitivity increases with firms' growth opportunities, which suggests that firms award higher equity compensation to attract managers with more talent.

1.2.2 Executive Compensation and Payout Policy

Chapter 5 investigates how corporate payout policy is influenced by CEO share ownership, CEO stock options and CEO long-term incentive plan (LTIP) holdings in UK firms from 1999 to 2008. Prior studies argue that when firms accumulate excess funds, irregular payouts of share repurchases are likely to increase with the level of managerial share ownership (Kahle, 2001; Hu and Kumar, 2004). However, the results of the association between share repurchases and managerial ownership have been inconclusive. For example, Bates et al. (2009) find that payouts to shareholders increase with the level of equity ownership by officers and directors. In contrast, Fenn and Liang (2001) find no significant relation between repurchase yields and the level of equity owned by management. However, they find that managerial stock ownership increases the total payouts for firms with low investment opportunities and high free cash flows. They also find a negative relationship between stock options and payouts because managers with high stock options outstanding prefer to maximise their wealth.

The results show that CEO share ownership and LTIPs have positive effects on corporate payout policies. The Tobit regression for CEO total compensation finds a positive association with dividend payouts. Meanwhile, the logistic regression shows a strong association between CEO shareholding and the likelihood of dividend payouts while LTIPs influence the likelihood of share repurchase programmes. This is because high CEO incentives will increase the total payouts of firms because of an alignment of interests between managers and shareholders. When managers are

compensated in cash and equity pay, the results show a high association between equity incentives and firms' payouts. In contrast, corporate governance characteristics do not show conclusive results which affect changes in payout policies. The dividend payout is significantly influenced by CEO share ownership compared to the share repurchase payout.

The findings support the notion that CEO share equity ownership is used to align managerial interest with shareholders in terms of cash payouts to shareholders. This implies that managers which are awarded with high power incentives such as share ownership or LTIPs will more likely work to promote shareholders' interests; for example, by making cash payouts to shareholders.

1.2.3 Executive Pay and Cash Holding

Finally, Chapter 6 explores the link between CEO equity compensation and corporate cash holding. The precautionary motive of cash holding suggests that firms increase the level of cash holdings following negative cash flow shocks, and that financially constrained firms increase their cash holdings more than unconstrained firms (Song and Lee, 2012). Another view on cash holding is due to the agency costs of free cash flow. Jensen (1986) argues that firms with large free cash flows will have severe agency conflict because managers may utilise excess cash for personal interests. Harford (1999) shows that managers make value-destroying investments in cash-rich firms. Therefore, when managers own a fraction of the shares in firms, they are more likely to behave according to shareholders' preferences because their wealth is tied to the firms' performance. Therefore, share ownership will act to incentivise managers to pursue value maximisation projects and constrain their private consumption tendencies to expropriate wealth from shareholders.

The sample for this chapter also consists of 183 UK listed companies from 1999 to 2008. Empirical evidence shows that CEO ownership, stock options and LTIPs have strong and positive associations with cash holding proxies. The results suggest that equity compensation is effective at alleviating the managers' and shareholders' conflicts of interest.

The findings also provide support to the precautionary motive of cash holding because firms with high volatility in their share prices hold higher cash levels compared with firms with low volatility. This could be attributed to firms' contingency policies to provide a buffer against future cash flow shocks.

1.3 Thesis Structure

Three issues are investigated in this thesis and are organised into separate chapters. Chapter 2 provides the review of literature regarding executive pay and incentives. Chapter 3 highlights the data and methodology used throughout this study. Chapter 4 examines the link between CEO pay-performance sensitivity and debt structure. Chapter 5 explores the relationship between CEO pay and corporate payout policy. Chapter 6 investigates CEO equity incentives and the cash holding of firms. Finally, Chapter 7 presents the conclusions, limitations and suggestions for future research.

Chapter 2: Literature Review

2.1 Introduction

This chapter provides an overview of existing literature pertaining to executive pay and incentives. On account of the separation of ownership, many companies experience difficulties in relation to management and control because management teams are required to run the businesses in a way which serves the interests of the primary shareholders. Thus, many managers are subject to scrutiny if shareholders believe that their management strategies are self-serving. For instance, shareholders could become concerned if a manager is focused on his corporate image, invests an excessive amount of cash into non-essential items or allocates a significant amount of funding towards low-value ventures. These tendencies contradict the obligation of management to focus on wealth maximisation. Further, the costs associated with monitoring management activities decrease the return on equity and the value of a business.

According to Shleifer and Vishny (1995), management are responsible for the redistribution of excess cash flow as well as investment decisions, business expansion and corporate legacy (Lambert, 1986; Agrawal and Mandelker, 1987; Cole and Mehran, 1998; Cadenillas, Cvitanic and Zapatero, 2004). To avoid agency conflict and mismanagement, corporate governance is practised and attractive remuneration packages are offered which provide a range of cash and equity-based incentives to managers.

The following chapter is divided into five further sections. The next section discusses the origins of executive pay and the incentive alignment hypothesis. Following this, the third section explores the different types of remuneration package while the fourth section provides an overview of equity compensation with an analysis of shares, stock options, long-term incentive plans (LTIPs) and restricted shares. The fifth section discusses prior quantitative studies performed in relation to executive pay while the final section provides an overview of what has been covered in this chapter.

2.2 Executive Compensation

Corporate shareholders must implement measures to ensure that managers are acting in shareholders' best interests. Consequently, because agent activities are largely independent from the principal, an attractive remuneration package is required to encourage managers to focus primarily on increasing shareholder equity. Thus, based on the principles of agency theory, the principal must implement rigid internal monitoring systems and establish a pay system which increases in line with company performance. In this way, the principal can offset the agency cost (Jensen and Meckling, 1976; Eisenhardt, 1989). Thus, because of the attractive remuneration package given by the principal, the agent will be more likely to focus on shareholder wealth maximisation and overall business performance. In other words, this is an effective way of safeguarding the interests of shareholders and deterring improper managerial activity.

According to Jensen and Meckling (1976), the impact of executive pay on protecting the interests of shareholders represents a significant aspect of the agency

cost of equity hypothesis and the subsequent managerial power theory (Bebchuk and Fried, 2003). Managerial power theory posits that the executive manager who has the power to determine his level of pay is more likely to act in the interests of the shareholders. The board of directors also acts in accordance with its own interests when electing a CEO because they pursue higher salaries or promotion opportunities. Thus, they may design an excessively high pay package for the CEO, which will have no impact on the conflict that could arise between the CEO and the shareholders.

Remuneration has a significant impact on management activities because the nature of the pay package offered will undoubtedly affect the likelihood of the manager focusing on shareholder maximisation, particularly if his level of compensation increases in line with business value (Jensen and Murphy, 1990). It has also been suggested that a more attractive remuneration package will lead to a more positive financial performance (Jensen and Meckling, 1976). According to Baker et al. (1988), the pay and bonuses offered should depend on the management level and should be high enough to ensure that a manager is committed to his role. Although Bebchuck and Fried (2003) believe that remuneration can actually exacerbate agency conflict, the most evidence generated on the topic to date suggests that it is an effective means of achieving incentive alignment (Jensen and Murphy, 1990; Finkelstein and Boyd, 1998).

Jensen and Meckling (1976) posit that incentive alignment can also be achieved by the implementation of managerial ownership through a shareholding system. Thus, if managers are allocated a proportion of company shares, they will most likely focus on wealth maximisation because it benefits them as well as the

shareholders. In effect, the ownership of shares will encourage managers to invest in high-value projects and will dissuade them from investing heavily in unnecessary luxuries. Over time, this will align the interests of management and shareholders and will contribute towards more positive company performance.

There are several other aspects of pay structure which can encourage managers to focus on increasing shareholder wealth. For instance, the incentive alignment hypothesis proposes that the degree to which managers pursue shareholder interests will depend on their level of pay. Tosi and Gomez-Mejia (1989) define incentive alignment as the degree to which a remuneration deal encourages a manager to run a company in accordance with the interests of the shareholders as opposed to pursuing personal interests. In many cases, managers who have made significant contributions to company value are offered more attractive remuneration packages, and if the level of pay fluctuates in line with company value or share price, managers are likely to avoid unnecessary spending where possible in order to increase shareholder wealth. However, it is difficult to identify the most appropriate level of remuneration based on company performance.

The combination of managerial ownership and equity bonuses is believed to alleviate hostilities between management and shareholders because conflict typically occurs when managers appear to be acting in their own self-interest as opposed to the interests of the shareholders (Smith and Watts, 1982). This issue occurs frequently because of information asymmetry, which contributes towards an increase in agency costs and decreases the return on equity due to shareholders.

Incentive alignment theory posits that manager remuneration and business performance can be positively correlated because shareholders have limited

knowledge of management activities and often cannot determine if managers are working in their best interests. Thus, this theory suggests that the remuneration package offered to the CEO can be directly correlated with overall company performance. In effect, the level of motivation displayed by the manager can be linked to pay-performance sensitivity because a higher level of sensitivity will encourage mangers to focus on business performance and shareholder wealth.

According to Fama (1980), such incentive schemes are not required because the manager will be motivated by market forces and the prospective bonuses they could acquire if they successfully increase company value. In most cases, managers are responsible for weighing up the risks and benefits associated with different ventures and must be held accountable for the outcomes of their decisions. A desire to maintain a positive market reputation will encourage managers to focus on wealth maximisation as opposed to personal gain because the reputation of the business reflects their own competence as corporate leaders. Thus, no incentive schemes are required because managers are already incentivised by external market factors.

Nonetheless, although Holmstrom (1982) acknowledges the impact of the labour market on managerial motivation, he claims that it cannot be used as an alternative to an official incentive contract because managers can only strive to succeed during the early phase of their careers when they are attempting to establish positive corporate reputations. In addition, the market cannot accurately determine the level of incentive on account of risk aversion or discounting practices. Gibbons and Murphy (1992) support this stance and assert that a contract is imperative because it offers an ideal level of executive incentive.

Contract alignment theory has been subject to extensive debate in existing

literature. Yermack (1995) generates inconclusive evidence with regard to the increase of pay-performance sensitivity in line with business growth and the decrease of pay-performance sensitivity in the event of managerial share ownership. This study analyses the financial performance of 792 American companies between 1984 and 1991 and employs the Tobit estimation measure to determine stock bonuses and the associated variables. The findings suggest that high-value companies demonstrated a lower level of stock incentives and manager share ownership as well as non-meaningful coefficients on firm leverage based on the Tobin's Q ratio. As a result, Yermack (1995) posits that the provision of stock options has little impact on the behaviour of management.

However, Core and Guay (1999) discovered evidence to suggest that the provision of stock options could be positively correlated with a reduction in agency conflict. The authors posit that companies demonstrating positive growth in terms of stock price were more likely to provide management with a range of stock options as a form of compensation. Coles et al. (2006) obtain similar findings when they compare pay-performance sensitivity (delta) to the level of research and development options using the three-stage least squares (3SLS) mechanism. This study identifies significant positive coefficients with regard to the risk-taking incentive (vega) based on fluctuations in management pay. The standard deviation in returns was 0.01.

According to Meulbroek (2001), the provision of equity-based rewards does not alleviate shareholder conflict because the rent extraction hypothesis posits that the board cannot objectively determine an appropriate level of remuneration. Further, if the CEO is in charge of salary calculations, he may allocate himself an inappropriately high rate of compensation (Bebchuk and Fried, 2003; Hanlon et al.,

2003). As a result, the managerial pay design system is implemented in order to prevent impropriety. The board of directors also acts in accordance with its own interests when electing a CEO because its members pursue higher salaries or promotion opportunities. Thus, the board could design an excessively high pay package for the CEO, which will have no impact on the conflict that could arise between the CEO and the shareholders.

Many existing studies have highlighted a positive relationship between executive pay and the resolution of agency issues with regard to improper management (Jensen and Murphy, 1990; Mehran, 1995; Murphy, 1999; Conyon and Murphy, 2000; Core and Guay, 2001; Coles et al., 2006). A link between CEO compensation and shareholder returns has also been identified (Jensen and Murphy, 1990). Similarly, Murphy (1990) and Core and Guay (2001) have discovered that an increasing level of managerial compensation contributes towards a more positive financial performance. In general, managerial compensation can be provided in the form of a salary, cash bonuses, share options, LTIPs (restricted shares and deferred benefits) and pensions. These different forms of compensation will now be discussed in more detail in following sections.

However, there is criticism that high incentive alignment will increase the managerial fraudulent behaviour especially among entrenched managers. For example, Gregg et. al. (2012) argue that managerial incentive structures lead the banks' collapse during the financial crisis in 2008-2009. The high powered compensation package including high stock options induce managers to increase the banks' exposure in risky investments such as credit default swaps and subprime mortgage asset derivatives. Other highly publicized collapse of Enron in early 2000s

also points to the danger of abuse of power by entrenched managers (Benston and Hartgraves, 2002; Healy and Palepu, 2003). These stories concur with Bebchuck and Fried (2003) managerial entrenchment hypothesis that high incentive alignment may shield rogue managers from early disciplinary action from board of directors and cost billions of losses to the shareholders.

2.3 Cash Compensation

This form of compensation uses salary and bonus opportunities to motivate managers to adhere to the shareholders' objectives. However, several studies have discovered that cash bonuses are relatively ineffective in reducing conflict between shareholders and management (Short and Keasy, 1988; Core and Guay, 1999; Fenn and Liang, 2001). In addition, there have been cases of companies offering managers excessive bonuses during periods of financial instability. Thus, although cash incentives can be used to initially motivate managers to perform effectively, more advanced pay incentives will be required to ensure that they continue to focus on shareholder wealth maximisation.

2.3.1 Salary

It has been suggested that salary levels can be a contentious issue between management and shareholders. Bebchuck and Friedman (2003) posit that many CEOs have the power to determine their pay, and that their salaries are not directly correlated with financial performance. This is particularly true in companies where the CEO is not answerable to a board or where the board lacks the authoritative force to restrict management actions. Nonetheless, the incentive alignment hypothesis

states that a higher salary will increase unity between management and shareholder objectives because a suboptimal level of pay will encourage managers to increase business value in an attempt to increase personal wealth. Thus, the establishment of a pay grade system which is based on performance could contribute towards a reduction in agency conflict.

Salary levels are usually set based on market standards, company size and employment responsibilities and the salary offer represents the foundational compensation contract. A study by Jensen and Murphy (1990) notes increases in management pay and shareholder returns because each increase of $0.02 in a manager's salary was correlated with a $1,000 increase in the company's market value.

A similar study by Conyon and Murphy (2000) analyses management salaries in the US and the UK and discovers that British CEOs earned a median base salary of £240,000, which represents at least 50% of the total level of compensation accrued. In comparison, CEOs in the US earned a median base salary of £317,000, which represents approximately 30% of their overall compensation packages.

2.3.2 Bonus

A bonus is typically offered when an employee demonstrates a high level of performance. Further, employees can often discuss bonus levels prior to accepting a management position. Nonetheless, bonuses could also be offered in special circumstances. The allocation of excessive bonuses to the CEOs of financial institutions led to public outrage during 2008 because despite British banks being bailed out during the economic crisis, they were still offering their managers unacceptably high bonus packages at the taxpayers' expense.

A cash bonus is usually offered based on the company's financial status, and the CEO could be more motivated to increase business value if a significant amount of his compensation package depends on the company's financial performance. Thus, aligning CEO bonuses with firm value can lead to business growth and a rise in earnings retained. Nonetheless, a study by Coles et. al. (2006) has discovered that cash bonuses can dissuade a manager from taking risks because he could become concerned about jeopardising the company's financial status.

2.4 Equity-Based Compensation

In many studies concerning agency theory, managers can often be presented as self-serving because they pursue their personal interests over those of the shareholders. This can cause significant issues in a company because any activity or venture which does not increase shareholder wealth can decrease overall business value. Thus, to deter managers from impropriety, an equity-based pay system can motivate employees to focus on achieving a positive financial performance. Further, many studies have considered the impact of equity-based compensation on risk-taking behaviour, debt accumulation, cash holding, earnings management, corporate payouts and research development.

2.4.1 Shareholding

When managers are offered a proportion of company shares, they become integrated into the ownership structure. Studies indicate that even a minimal allocation of shares has a positive impact on company performance (Short and Keasy, 1988). However, once the level of ownership exceeds 25%, a negative

correlation can be identified. This is explained by the fact that a small number of shares will increase management pay if the company continues to perform well; conversely, if the manager is offered a controlling share in the business, he can restrict monitoring activities on behalf of the board and will no longer be obliged to pursue only the interests of the shareholders.

2.4.2 Stock Options

The provision of stock options has been linked to an increasing tendency towards risky business decisions on account of the convex pay-off due to the convexity of delta, which leads managers who could generally be risk-averse to reconsider their stance when exploring investment opportunities. Managers' pay will increase if their stock options reach strike price, which induces many CEOs to engage in riskier behaviour. Thus, research indicates that the provision of stock options increases the likelihood of risky decision-making, a theory which is substantiated by Core and Guay (1999) who have discovered that risk level increases in instances where a manager’s stock options are about to reach maturity.

The allocation of stock options is a commonly employed measure to avoid agency conflict and is often used instead of the managerial ownership method. In terms of option-based compensation (OBC), the convex pay-off encourages managers to consider riskier investments which they would normally disregard (Amihud and Lev, 1981; Smith and Stulz, 1985, Guay, 1999; Bebchuk and Fried, 2004). Nonetheless, this can also increase the likelihood of financial failure. Thus, an attempt to unite the interests of management and shareholders through the provision of stock options could have a detrimental impact on debt accumulation and financial performance.

According to Smith and Watts (1992), a company determines the most appropriate compensation system based on the attributes of the company, particularly in terms of investment activity. The authors posit that by manipulating the convexity of the link between performance and manager compensation, the board can ensure that managers give due consideration to some of the more risky investment opportunities which they may encounter. In addition, the authors claim that high-growth companies with minimal assets are more likely to offer stock options to managers because management activity cannot be overseen. Bizjak et al. (1993) also state that these companies could implement a more lengthy performance appraisal period when calculating compensation in order to safeguard against the effects of information asymmetry. The authors of both studies conclude that an increase in information asymmetry will limit the extent to which directors can ensure that management chooses only high-value investment opportunities. Thus, companies which predict significant development in the future should offer management a range of stock options to incentivise managers as opposed to using salary or bonus schemes which require the ability to oversee management activities directly.

However, quantitative evidence on the efficacy of stock options as a reward mechanism contradicts the above assumptions. For example, Yermack (1995) and Bizjak et al. (1993) identify negative correlations between the provision of stock options as a form of compensation and an increase in positive investment decisions. Bizjak et al. (1993) explore the likelihood of high-growth companies offering a higher number of less restricted stock options in comparison to companies with a significant number of assets on account of information asymmetry with regard to future product developments. This comparative analysis is performed using a ratio of

firm value to the book value of assets. The authors discover that a lower number of bonuses are offered to managers as the level of growth opportunity decreases in cases where incentive models are associated with significant negative correlations. Yermack (1995) comes to a similar conclusion because the author generates no evidence to suggest that stock options are provided more regularly by companies with extensive growth opportunities. This finding is based on the author's application of Tobin's Q in order to determine whether growth can be positively correlated with the provision of stock options to CEOs between 1984 and 1991. Yermack (1995) considers the variable equivalent to Tobin's Q by combining the book value of assets with the market value of common stock minus the book value of common stock. This figure is then divided by the book value of assets. The author then analyses the results using the Tobit model and discovers a negative correlation between the pay-performance sensitivity of managers provided with stock options and the number of business growth opportunities. In addition, there is a relatively insignificant connection between compensation and Tobin's Q.

Those identifying a positive correlation include Lewellen et al. (1987), Smith and Watts (1992), Gaver and Gaver (1993) and Bryan et al. (2000). According to Lewellen et al. (1987), the provision of stock options as an incentive alleviates potential agency conflict because managers will avoid investments which reduce share price on the grounds that these will directly impact on their future earnings. In fact, the authors discover negative coefficients with salary and bonuses using after-tax pay and the market to book value of equity ratio. Thus, they posit that compensation in the form of equity can deter managers from choosing the least risky investment options because significant positive coefficients were identified on stock

return variance and the debt-equity ratio.

2.4.3 Long-Term Incentive Plans (LTIPs)

This form of compensation was first offered by companies in 1995 after the Greenbury Committee decided that companies could offer limited employee stock options (ESOs) or LTIPs in place of the unrestricted share options (ESOs) which had usually been provided. Buck et al. (2003) define LTIPs as cash or equity-based rewards which are offered on the basis of productivity. LTIPs can be considered similar to vested stock options because they have vesting conditions and zero exercise prices. However, managers are not obliged to make payments in order to exercise their awards.

2.4.4 Restricted Shares

According to Bryan et al. (2000), a positive correlation can be identified between increasing research and development activities and a rise in the provision of stock options. Further, the authors posit that as the pay-off of restricted equities is in line with share price, such equities do not provide the same incentive to managers to pursue riskier investment opportunities because managers do not feel as if they are being compensated for taking such risks. In many cases, managers can choose not to enter into risky ventures despite the potential for significant profits, a situation which exasperates underinvestment issues. This is particularly relevant for companies with a high number of investment options because firm value can only increase if investment opportunities are pursued (Guay, 1999). It has also been suggested that such companies tend not to offer a wide range of restricted shares to company management. A study analysing the level of investment opportunities based on R&D

expenditure and firm value is conducted by Bryan et al. (2000). They discover a negative correlation between investment options and restricted stock.

These commonly used equity-based pay schemes account for a significant proportion of long-term executive pay (Jensen and Murphy, 1990; Blair, 1995; Tosi et al., 1997), and the transition from cash to equity-based rewards reflects the integration of management into the ownership structure in an attempt to increase managers' motivation and organisational commitment (Berle and Means, 1991; Hall, 2000; Ezzamel and Watson, 2002). According to Vogel and McGinnis (1999), shareholders have applied such measures in an attempt to ensure management act in their interests, to deter them from impropriety or mismanagement, to increase share value and to promote business growth (Sanders, 1999; Hall, 2000; Sanders 2011).

2.5 Empirical Studies on Executive Pay

2.5.1 Firm Performance

Research implies that creating an association between company performance and managerial pay can alleviate the agency cost of debt (Jensen and Meckling, 1976). According to the researchers, managers make more effort to increase profits if their remuneration comes from equity incentives. Essentially, therefore, managers who part own a company are more productive and useful to the business (). An increase in share price, appreciation in the level of earnings delivered by each share, Tobin's Q, return on investment (ROI), and a rise in profit are all examples of company performance indicators. In addition, companies can use industry standards and the performance of others as an indication of their own performance levels. Company managers are able to achieve higher earnings and sustainable business

operations when they hold a competitive edge over their market rivals.

2.5.2 Pay-Performance Sensitivity

The conflict of interest between public firms' shareholders and managers is represented by the principal-agent theory. According to the theory, shareholders are at risk of being negatively affected by the poor decision-making of company managers, which can damage the principal income of the shareholders. According to contract alignment theory, the provision of agent incentives means that managers are more likely to make good decisions when company performance is linked to their personal incomes. When managers are motivated in this way, shareholders' interests and returns are more likely to be promoted by the managers' decisions.

Pay-performance sensitivity, *b*, refers to the dollar change in a CEO's wealth associated with a dollar change in the market value of the firm. Higher sensitivity indicates a closer alignment between CEO and shareholder (Jensen and Murphy, 1990). However, other researchers have suggested that firm performance represents the dollar return, *b*, and percentage return, where pay-performance sensitivity (in thousands of dollars) changes with percentage returns to shareholders or *delta* (Aggarwal and Samwick, 1999).

Ciscel and Carroll's (1980) classic executive pay study suggests that firm size and sales are more significant when identifying firm performance than profits or return on equity (ROE). On the other hand, some studies argue that when bonuses and salaries are the only measures used in such research, we are unable to accurately determine the level of pay-performance sensitivity which exists (Murphy, 1985). This is because these studies leave out deferred payments, stock options and stock, all of which are considered to be highly influential incentives. Varied outcomes have

been found for time-series regressions in the case of pre-tax executive compensation. Murphy's (1985) study, for instance, discovers that there is a significant positive correlation between company growth (i.e. sales figures) and bonus and salary, as well as a significant positive correlation between stock market performance and bonus and salary. On the other hand, only stock market performance has been found to have a positive correlation to deferred payment – no positive correlation was found between company growth and deferred payment. According to Murphy (1985), it could be that stock option grants take place when company performance is suffering because stock options can be reset at a lower rate. This could be the reason behind the negative correlation between firm performance and stock options.

The relation of pay elasticity to fluctuations in company earnings is used to indicate the sensitivity of pay to company performance. Other researchers have shown that this arises when the company has a high number of outstanding stock options (e.g. Jensen and Murphy, 1990; Hall and Liebman, 1997, Hall and Murphy, 2002 and Hanlon et. al., 2003). On the other hand, pay-performance sensitivity drops when the company's convertible and long-term debt levels are high.

Alignment theory research states that there are a number of variables involved in pay-performance sensitivity. For instance, early studies show that executive compensation is highly influenced by company performance variations (Murphy, 1985). In Murphy's study, companies with both low and high return variances (where the CEOs' payments were similar to one another) were investigated. It is suggested that because the payments received by the CEOs were not correlated to company performance, pay-performance sensitivity regression is not an accurate measure.

However, other research suggests that shareholders' incentives and managers' incentives can be successfully combined when using equity-based compensation plans (Meulbroek, 2001). Although the advantages of connecting company performance to executive compensation are acknowledged by financial theorists, the findings of empirical studies on pay-performance sensitivity influencers are ambiguous. Therefore, the main objective of this chapter is to investigate the extent and influencers of pay-performance sensitivity.

2.5.3 Risk Taking

When managers do not wish to expose their business to the risk of insolvency, they typically steer clear of high-risk actions because they are risk-averse. However, the risky decisions made by some less risk-averse company managers are prominent issues within the agency relationship. On the other hand, some risk-taking can increase income and therefore be of benefit to shareholders, which can result in shareholders preferring stock options which actually encourage managers to take risks. The value of such options rises in line with the underlying asset's risk convexity. When the share price's delta (or risk) rises, the managers' risk aversion issue will be alleviated by the increase in gains.

Stock option values will rise in line with share price fluctuations, which can lead managers to make high-risk investment decisions so that they can obtain the highest stock gains. However, the advantages of making high-risk investment decisions will decrease when this behaviour results in increased company debt costs. This is because firms will experience a greater risk potential in terms of insolvency. Further, one study finds that company delta causes a rise in the investment's vega (Agrawal and Samwick, 1999). The balance of risk will have an impact on a

company's value from the perspective of the debt holder because there will be a higher risk of default when greater risk levels are present. Managers will take on higher-risk investments when they have more outstanding stock options. Further, in order to account for potential fluctuations in company performance, debt holders will adjust their long-term debt costs.

One American study conducted almost 20 years ago investigates the agent issues between debt holders and shareholders, as well as the agent issues between shareholders and managers (Yermack, 1995). In this study, it is suggested that risk taking is motivated by stock options, but only to some extent. As discussed, when a larger portion of managers' earnings are linked to shareholder value or company performance, managers are more likely to take risks. This helps to avoid the pitfalls of underinvestment. In this case, managers should make decisions which are linked to greater risk (i.e. likely to bring better earnings) while avoiding making the wrong investments and risking their companies' entire wealth.

Some researchers concentrate on manager compensation and capital acquisition. One group in particular explores acquisitions and mergers in order to ascertain how manager's pay influences investment decisions (Datta et al., 2001). The researchers assess whether obtaining a pre-acquisition management payment structure could be a factor in a bidding company's negative announcement of stock price response. It was suggested that managers with low levels of equity-oriented payment who are motivated by their own interests tend to pay too much for targets. The researchers also examine the link between executive pay and the investment risk acquisition premium by analysing certain companies' growth options through market-to-book estimation. The study finds that executive pay in acquiring

companies is comparably associated to acquisition-based risk factors (i.e. company growth options and post-takeover differences in bidding companies).

Core et al. (1999) and Conyon et al. (2009) find a negative or non-significant correlation between manager's compensation and company risk. On the other hand, some researchers have discovered that high-risk companies are linked to higher levels of executive remuneration (i.e. Cyert et al., 2002). One group of researchers also suggest that high-risk firms are associated with higher levels of compensation when managers are risk averse (Conyon et al., 2009).

2.5.4 Capital Structure and Cost of Debt

A company's capital structure can have an impact on pay-performance sensitivity. One researcher suggests that firm performance and compensation flow can be affected by the type of (non-convertible and convertible) debt (Ortiz-Mollina, 2006). Debt can be thought of as a type of debt holder monitoring and relationship-building agent. Managers tend to take fewer risks when defaulting leads to a risk of the firm going bankrupt. Debt can also help managers to control their free cash flow spending (Jensen, 1986). However, there is a strong correlation between pay-performance sensitivity and capital structure because debt promotes corporate resource management, which means that shareholders will not depend on executive compensation as a means of incentive alignment.

According to agency theory, manager-shareholder conflicts of interest can be alleviated (and managerial compensation can be influenced) by debt. Debt lowers the level of free cash flow which managers are able to obtain because monitoring increases. This means that when the risk of bankruptcy appears, managers must consider the best financial interests of shareholders. Under agency theory, pay-

performance sensitivity is smaller for high-debt companies when alternatives are available for high alignment incentives and high debt. Some researchers propose that debt funding can lower the agency cost of equity (Jensen and Meckling, 1976), while others have found that managers tend to select profit-maximising positive NPV ventures when debt increases the risk of bankruptcy (Grossman and Hart, 1982).

According to Ortiz-Mollina (2006), debt leads to a lower reliance on high-level stock/stock option incentives when bondholder monitoring is present. Further, free cash flow issues can be alleviated via debt. The researcher also finds that companies with a combination of convertible and straight debt had an $11.58 sensitivity, while companies with only straight debt exhibited $10.18 sensitivity.

Risk-averse managers lean towards long-term or lower debts because of the impact of managerial decision-making on debt maturity structure and leverage decisions. One study supports this theory by illustrating that equity is more popular than debt financing with entrenched managers (Berger et al., 1997). Other researchers show that long-term debt is preferred by managers who receive lower equity-based pay (Datta et al., 2005), and that short-term debt is avoided by entrenched managers (Benmelech, 2006). Additionally, other researchers suggest that companies' debt levels depend significantly on the entrenched and alignment impacts of managerial shareholding. This is particularly the case when a firm's corporate governance lacks strength (Florackis and Ozkan, 2007).

2.5.5 Payouts

Payouts and other sections of corporate financial policy can be affected by executive pay. One study shows that managers favour share repurchasing in order to remunerate shareholders when they hold a greater number of stock options because

share prices will drop due to the dividend payment, which leads to lower stock option values (Fenn and Liang, 2001). Managers typically avoid shareholder dividends in favour of buy-back schemes when seeking to limit financial losses. However, cash returns to shareholders depend on a company's executive equity incentives, which means that share repurchases and dividends are not a viable alternative.

Some researchers suggest that stock options lead managers to decrease shareholder dividends because future dividend payouts have a negative correlation with stock option values (Lambert et al., 1989). As such, dividends are not as effective as share repurchases when it comes to distributing free cash flow to shareholders. In Lambert et al.'s (1989) study, 221 American merchandising companies were analysed with regard to their 1956 dividend payouts and stock options. The researchers find that there is a significantly negative correlation between executive stock option grants and dividend payouts.

Other researchers find similar results. For instance, one study investigates the ways in which executive stock options are affected by financing decisions and dividend payouts (Smith and Watts, 1992). The researchers use the dividend-price ratio/dividend yield as the dividend policy, and suggest that companies offer lower dividend payouts when investment opportunities are higher (as per optimal contracting theory). The researchers believe that a positive correlation could exist between the dividend yield and the level of in-place assets, along with a negative correlation between stock options and dividend yield. In the study, the latter point has greater support.

Other studies have shown similar findings. One study analysed 1,100 non-financial companies and found a strong negative correlation between executive stock

options and dividends (Fenn and Liang, 2001). According to these researchers, companies with outstanding executive stock options are more likely to offer cash payouts in the form of share repurchases and not dividends.

Bens et. al. (2003) concur with the evidence that managers prefer share repurchases because of dilutive effects from earnings per share (EPS) on the stock option outstanding. They conclude from their analysis of S&P 500 firms from year 1996 to 1999 that managers increase the level of share repurchases to offset lower EPS when stock options are in the money.

In other study, Bagwell and Shoven (1988) propose that share repurchases are useful when the firms need to restructure their leverage level.

2.5.6 Cash Holding

Keynes (1936) suggests that cash holding is driven by the agency cost of debt, transactions and precautions. When companies' cash flow is unstable, they will attempt to secure more cash holdings, particularly in times of economic problems. When motivated by precautions, cash holdings can assist managers to hold on until a recession has passed. When motivated by transactions, firms' own cash reserves are often used for business ventures. This is a cheaper option than bank loans or capital market funding, and helps to lower interest costs as well as additional debt holder monitoring.

Cash holding studies such as those conducted by Almeida et al. (2004), Acharya et al. (2007) and Bates et al. (2009) have concentrated on the advantages of cash holding in terms of funding and escaping additional expenses. Myers and Majluf (1984) find that in an imperfect capital market, internal financing is cheaper

than external funding. This is due to the presence of asymmetric information, which tends to bring higher expenses to smaller companies because they have weaker access to the capital market than larger companies.

Other multinational research demonstrates the agency cost of free cash flows when companies with more shareholder rights have lower cash holdings. For instance, one study shows that companies in regions which have little shareholder protection tend to have higher cash holdings than companies in locations with greater shareholder protection (Dittmar et al., 2003). This study also demonstrates that in countries with little shareholder protection, asymmetric information and investment opportunities have a lower significance in terms of cash holdings.

One British study discovers that cash holdings decrease when there is 24% or higher managerial ownership; rise when there is 64% managerial ownership; and decrease with 24% or less managerial ownership (Ozkan and Ozkan, 2004). The magnitude of cash management policy and managerial entrenchment in companies which possess ineffective corporate governance can be seen in the non-monotonic relationship which exists between the cash holdings and managerial ownership of companies. The researchers discover positive correlations between cash holdings and cash flows, and cash holdings and growth opportunities. There are also correlations between low leverage and cash holdings, and low bank debt and cash holdings (Ozkan and Ozkan, 2004). Other researchers suggest that valuation discounts are used by external shareholders when firms have high cash holdings (Kalcheva and Lin, 2007), because shareholders predict significant manager-shareholder conflict based on their global selection of companies' managerial entrenchment. These research papers primarily measure managerial entrenchment issues via the degree of

managerial ownership.

Some researchers examine the ways in which internal fund distribution is influenced by the agency problem (Harford, 1999; Harford et al., 2008). It has been suggested that wealthy American companies are likely to take on diversifying acquisitions. Here, value drops in accordance with free cash flow agency theory (Harford, 1999). It has also been suggested that companies with poor corporate governance structures tend to hinder their ability to operate by spending cash rashly (Harford et al., 2008). Other researchers suggest that the operating performance of cash-rich companies is either similar to or better than the operating performance of companies which have higher market-to-book ratios, improved investment opportunities or are of a comparable size (Mikkelson and Partch, 2003). Additionally, Mikkelson and Partch (2003) find no correlation between the difference among affluent companies' performance and their corporate governance qualities.

2.5.7 Earnings Management

Managers may misuse their authority when they are given complete say over all business decisions, particularly when their personal wealth is affiliated with the company's revenue. As such, some managers have been known to doctor the company's books in order to appeal to return-hungry shareholders. When the company's share price increases due to improved performance, managers are sometimes able to get away with these tactics unscathed. Additionally, some companies strategically wait until rival firms are set to release discouraging profit announcements to the public before broadcasting their own supposedly favourable profits.

This can often happen when company managers have some sort of higher-level investment in meeting company targets (e.g. increasing brand reputation, covering up misconduct and making a name for themselves within their sector). Personal affluence is also an obvious and significant motivator for managers. Further, new managers could feel the need to prove themselves by adjusting the company's books in order to avoid monitoring.

However, any misleading alterations of company profits made by managers leave those managers at risk of grave repercussions such as fraud charges. Other consequences include trials, audits and financial penalties along with damage to the managers' and company's reputations. Share prices can drop in value and the long-term success of the company can be seriously hindered.

One study shows that when companies are based in countries in which investor protection policies focus on share prices and on preventing managers from changing company figures, expectations management occurs far more often (Brown & Higgins, 2005). The researchers find that the UK leads in this respect. Other research supports the view that companies in the UK tend to prefer to achieve or surpass analysts' expectations using expectations management rather than earnings management (Athanakasakou, Strong and Walker, 2009).

2.5.8 R&D

Research indicates that R&D investment has a positive relationship with CEO equity-based compensation. This is because it promotes a continuous increase in share price. R&D is an area in which managers are told to invest heavily in order to improve profits by obtaining profitable contracts and expanding market share. On a long-term basis, R&D projects help companies to effectively manage revenue which

comes in from activities which occur in the future.

One researcher investigates whether or not managers' incentive programmes include convexity in order to negate the impact of risk aversion and promote investment in worthwhile high-risk ventures (Guay, 1999). The researcher suggests that if risk-averse managers are successfully encouraged to take on risky, positive NPV ventures, developing companies can experience further growth. The researcher represents investment opportunities with R&D spending, capital spending and book-to-market. He discovers that there is a positive correlation between vega (as the dependent variable) and R&D focus, opportunities for investment and company size.

Another study discovers that CEOs with high levels of knowledge who are heading towards retirement typically experience below-par investment incentives. However, if the CEOs' post-retirement affluence is linked to stock price, this is not the case (Bizjak et al., 1993). The researchers suggest that in companies which place a great deal of emphasis on R&D, investment distortions caused by equity-based pay are not significant. Since the research study does not show a correlation between company growth opportunities and the age of new CEOs, this finding goes against the original prediction that companies with large levels of asymmetric information could decide to employ young CEOs in order to extend the CEOs' length of service with the companies.

2.5.9 Corporate Governance

One study suggests that an internal system can be used to manage managers (Fama and Jensen, 1983). According to Fama (1980) and Shleifer and Vishny (1986), this is a type of corporate governance which has shareholders' interests at heart and guards them from the self-oriented decisions of greedy managers. McKnight and

Weir (2009) add that this approach can lower the principal-agent conflict, thus positively affecting agency cost.

There is a great deal of contention surrounding the correlation between corporate governance and executive pay. One study suggests that manager-shareholder interests can be linked through the internal governance mechanism (Demestz and Lehn, 1985). Here, the mechanism is utilised in order to regulate, supervise and manage the business decisions and behaviours of company managers. As such, managers working under an effective board of directors tend to use their authority more wisely and avoid information doctoring, etc. In the UK, firms are bound to the Greenbury Report (1995), which sets the rule that the independent remuneration committee's board of directors is responsible for setting managerial compensation within the agency environment.

Therefore, shareholders' interests and affluence can be upheld and encouraged through the use of corporate governance, thereby restricting wayward managerial activities. Corporate governance depends on a number of factors, including the directors' ages and histories, the size of the board, whether or not the chairman and CEO are the same person, and the amount of board directors who are not at the executive level (La Porta et. al., 1997; Hermalin and Weisbach, 1991; John and Senbet, 1998). Independent boards decrease the probability of managerial entrenchment, and the risk of the board implementing penalties can be sidestepped, which reduce the friction between managers and shareholders (Sharma, 2011) Managers tend to make self-centred business decisions in the absence of a strong board of directors, but linking company performance to managerial compensation can allow the board to effectively supervise managerial decisions.

Directors attempt to link shareholder-managerial interests by aiming towards company goals, which brings about the necessary compensation schemes and policies. According to the Financial Times (2014), leading executives have been known to request compensation of up to 120 times more than the norm. In this case, it is the responsibility of the board to make sure that such a manager is behaving in the best interests of the company, rather than his own best interest. Bohren et. al. (2012) suggest the use of dividend policy by strong shareholders to mitigate the conflict of interest. Therefore, it can be seen that upholding shareholder interests requires the board to play a significant part in policing managerial activity.

2.6 Summary

Overall, this paper has shown that the existence of manager-shareholder conflict can lead to a requirement for compensation schemes which uphold both the shareholders' and managers' interests. According to contract alignment theory, managers make better decisions when their company's performance is associated with their own personal wealth. When managerial pay is associated with the company's share price, as in high-powered incentives, managers will be more likely to make decisions which benefit shareholders.

However, researchers have produced ambiguous findings about the correlation between company performance and managerial shareholding. One study, for instance, demonstrates that a company's Tobin's Q has a non-linear correlation to managerial ownership (Morck et al., 1988). The researchers discover that managers with a low ownership proportion are more concerned about shareholder interests, but that manager-shareholder conflict arises once managers possess a 5% share in the

company because of entrenchment effects.

Shleifer and Vishny (1995) find that the manipulation of revenue can be one of the consequences of managerial discretion. Further, researchers such as Lambert (1986), Agrawal and Mandelker (1987), Mehran et al. (1998) and Cadenillas and Zapatero (2004) show that managerial discretion can lead to problems with underinvestment or overinvestment, empire building and uncontrolled diversification. Corporate governance and equity-based or cash-based executive compensation are examples of strategies which can be utilised to minimise the agency problem. Finally, this paper has addressed its overall aims of investigating how pay-performance sensitivity is influenced by debt, and the ways in which UK companies' monetary policies (i.e. cash holdings and payouts) are affected by managerial pay.

Chapter 3: Data and Research Methodology

3.1 Introduction

This chapter presents the overall sample utilised for this study, the description of the key variables for the compensation data, the data sources and the research methodology. The originality of this research rests on the use of hand-picked executive compensation data for UK FTSE 350 companies which enables critical analysis of the effect of executive compensation components on corporate financial policy. This segregation is important because prior studies are mostly based on US data (e.g. Boyd, 1994; Core et al, 1999; Bryan et al., 2000; Graham et al., 2012).

Section 3.2 will discuss the sample construction, and is followed by the definition of key compensation and other variables in Section 3.3. Section 3.4 provides the descriptive statistics for the compensation data and trends relating to executive pay in the UK. In Section 3.5, a brief overview of panel data analysis is provided, and Section 3.6 summarises the chapter's data and research methodology.

3.2 Sample Construction

This research aims to examine pay-performance sensitivity and the effect of executive compensation on payout policy and cash holdings. The study uses a sample of 183 UK firms from the FTSE 350 for 1999 to 2008. The sample of firms is hand-picked based on the availability of directors' remuneration data in annual reports for a minimum five-year period. There are nine industries included such as

manufacturing, utilities, financial institutions (excluding pension and fund companies), consumer products, healthcare, property and retail.

This research adopts a time-series sampling of firms by selecting a sample from a much larger group, that is, the entire population of large companies in the UK. This comprises 350 companies listed on the FTSE 350 index. The rationale behind this selection is that the sample consists of a wide range of large corporations which are distributed across the UK and operate in various industries and market sectors. This provides a substantial size for the sample, which is likely to increase the probability of the sample being representative of the population. By taking a panel data approach, the in-depth analysis of regression is able to explain the variability in the longer term than a single time period. It is also noted that companies which are listed on the FTSE have an obligation to publish annual reports, making access to the required data more feasible.

The final sample consists of 183 publicly traded companies listed on the FTSE 350 as shown in Table 3.1. Financial institutions such as pension funds and unit trust companies are excluded from the sample because these firms have massive financial assets and boards made up entirely of non-executive directors. The data include remuneration details relating to the boards of directors, including CEOs and chairmen. All these variables are extracted from company annual reports from 1999 to 2008. The firms in the sample cover most sectors of the economy and are the most highly represented companies.

Data are collected for the years corresponding to 1999 to 2008. The reason why data are collected up to 2008 is to exclude the effect of economic distress during the financial crisis after this year (Li et al., 2013). Another selection criterion is that

for a firm to be included in the sample, it must have been listed for at least five consecutive years during the period of study. This is in accordance with prior studies which allow extensive and robust regression analysis for panel data with a minimum five years of firm-year observations. Because of missing annual reports and poor disclosure of executive compensation, some of the UK firms in the initial sample of 350 are excluded. The final sample of 183 firms is selected after those firms with missing Datastream information are excluded.

The selected firms used in this study come from nine industries, as illustrated in Table 3.1. The classification of industries follows Datastream classification. The annual report sections on directors' remuneration provides detailed information on directors' salaries, bonuses, number of shares and stock option holdings. In addition, in order to estimate stock option value, the valuation is done using the modified Merton, Black and Scholes method following Jensen and Murphy (1990). The distribution of the sample is presented in Figure 3.

Pension and unit trust firms are excluded from the sample because cash compensation and equity compensation data are not detailed in the directors' remuneration report sections and because the firms have massive financial assets. Further, the unit trust firms' boards of directors are composed entirely of non-executive directors, which is a different structure to the boards of banks and insurance companies.

Table 3.1: Sample Selection

	Number of firms	Number of observations
FTSE 350 firms	350	3352
Exclude		
Pension, unit trust firms	26	188
Missing observations of annual reports/compensation	59	526
Missing corporate governance data	47	454
Missing Datastream observations	51	508
Final sample	183	1674
Distribution by year		
1999	172	172
2000	173	173
2001	167	167
2002	162	162
2003	164	164
2004	164	164
2005	166	166
2006	165	165
2007	173	173
2008	168	168
Total	183	1674
Distribution by industry		
Financial (bank, insurance)	19	175
Utilities	6	54
Manufacturing	41	402
Mining and Quarrying	33	313
Wholesale and retail	42	394
Hotel and restaurant	17	165
Technology	8	71
Transport and communication	7	38
Others	10	62
Total	183	1674

3.3. Definition of Variables

This section discusses the key variables used throughout this study. For executive compensation, data are hand-collected from the sample firms' annual reports. This approach is taken in order to gather a detailed remuneration database for the cash and equity components in executive pay. Prior studies which use manual data collection based on annual reports note the differences of terminology used in annual reports to describe compensation type (e.g. Alagla, 2012).

3.3.1 Cash Compensation

Cash compensation relies on a salary and performance bonus as incentives to achieve a firm's target. Such compensation may be in the form of a salary, bonus, allowance or benefits in kind which are received by the CEO during the financial year (Eriksson, 1999; Conyon et al., 2001;). Studies by Core and Guay (1999), Short and Keasy (1999) and Fenn and Liang (2001) document that cash compensation could work to alleviate agency conflict but it is not effective. For example, some failing corporations reward their top management with extravagant bonuses during financial crises. It can be argued that cash compensation is not a stand-alone measure against agency conflict but instead serves as a starting point in setting appropriate pay packages for management.

3.3.1.1 Salary

Bebchuck and Friedman (2005) argue that executive pay can be the cause of agency conflict between managers and shareholders. They contend that self-interested managers will set up remuneration pay to fulfil their desires for high pay without considering the performance of their companies.

Table 3.2: Definitions of Compensation

Terminology	Other
Salary	1. Base pay 2. Basic pay
Bonus	1. Cash bonus 2. Performance bonus
Long-term incentive plans (LTIPs)	1. Executive incentive plan 2. Performance share plan (PSP) 3. Performance share award (PSA) 4. Share matching plan 5. Restricted shares
Executive share options (ESOs)	1. Stock options 2. Share options 3. Performance options 4. Save as you earn (SAYE) options
Benefits	1. Benefit in kind 2. Allowance
Deferred bonus	1. Deferred share scheme 2. Deferred annual bonus share award 3. Short-term deferred incentive plan
Source: Adapted from Alagla (2012)	

3.3.1.2 Bonus

A bonus is a form of cash compensation which is traditionally linked with firm performance. When managers are hired, they can negotiate the level of their performance bonuses in advance. However, a firm could award the annual bonus based on firm performance; or in some cases, pay the bonus regardless of the company's bottom line. Several studies use bonus as a pay component for firm performance (Boyd, 1994; Anderson and Bizjak, 2000; Ozkan, 2007).

3.3.2 Equity Compensation

3.3.2.1 Stock Options

The value of stock options is derived using the Black-Scholes (1973) model based on European call options which can only be exercised within a specified future date, normally three to ten years after the grant date. Hall and Murphy (2002) argue that a valuation based on the Black-Scholes (1973) model will attribute a value which is higher than the cost of the options. The model adopted here is based on that of Black and Scholes (1973) as modified by Merton (1976) in order to account for dividend payments, following the approach taken by Yermack (1995). Thus:

$$V_{jo}(\mathrm{t}) = Q_j[V_j e^{-d_j T} N(z_1) - XV_j e^{-r_f T} N(z_2)]$$

$$z_1 = \frac{\ln(\mathrm{Vj/X}) + (\mathrm{r_f} - \mathrm{dj} + \sigma^2/2)\mathrm{T}}{\sigma\sqrt{\mathrm{T}}}$$

$$\mathrm{z2} = z_1 - \sigma\sqrt{\mathrm{T}}$$

where the elements of the model are as follows.

Q_j = total shares outstanding in firm j covered .

X = strike price of the options.

V_j = share price of underlying stock at the grant date.

T = time to expiration of options.

r_f = ln(1 + risk-free rate); risk-free rate for the ten-year UK government issued bond (Yermack, 1995)

d_j = expected dividend rate over life of option; ln(1 + expected dividend yield); this is based on dividend yield at time t following Yermack (1995).

σ_j = share price volatility over life of option; historical volatility as used by other studies (Yermack, 1995)

For options valuation, one of the critical parameters is the volatility of underlying assets. There are two types of volatility which can be estimated: historical and implied volatility. The historical volatility method is more commonly employed in options valuation by using annualised standard deviation of the stock prices. Following Yermack (1995), Guay (1999) and Haug (2007), this paper employs the historical volatility method using annualised standard deviation as follows:

$$\sigma = \sqrt{[\frac{1}{n-1}\sum_{i=1}^{n} ln\left(\frac{Close_i}{Close_{i-1}}\right) - \frac{1}{n(n-1)}\sum_{i=1}^{n} ln\left(\frac{Close_i}{Close_{i-1}}\right)]^2}$$

As noted by Yermack (1995), the Black-Scholes valuation does not account for options trading because firms will usually impose restrictions on executives' ability to trade their stock options in the market, thus providing a smaller chance of hedging or gaining a profit. Potential problems regarding options valuations based on the Black-Scholes-Merton model are avoided by focusing on new options grants (Yermack, 1995; Ortiz-Molina, 2006; Kabir and Minhat, 2009). Other models for options pricing, such as the binomial model, arbitrage pricing models and Monte Carlo models, use the random walk effect and assume the appreciation of options according to the risk-free rate. According to Main et al. (1995), the Black-Scholes formula offers a reliable way to evaluate the holding of executive share options from issue date to exercise date.

For the calculation of delta and vega for stock options, Core and Guay (2002) approximation methods are used. The required data for the calculations are the option’s strike price, time to maturity date, standard deviation, the current share price, interest rate and the firm’s dividend yield. Options' strike prices together with

expiry dates are hand-collected from the annual reports. The fiscal year ends from 1999 to 2008 are used for the year-end stock prices. The standard deviations are calculated by taking the standard deviation of the last 120 days prior to the year-end in order to estimate the volatility. The dividend yield is obtained from Datastream, and the ten-year yield to maturity is used to estimate the risk-free rate.

3.3.2.2 Long-Term Incentive Plans (LTIPs)

This incentive plan was debuted into the UK in 1995 following the Greenbury Report as a substitution for existing stock options plans with performance linked plansAccording to Buck et al. (2003), LTIPs are awarded as a form of cash grant or shares with performance conditions. LTIPs are measured by using the face value of the plan where the share price on the date of the award is used to calculate the value.

3.3.3 Corporate Governance Variable

Fama and Jensen (1983) propose using an internal control mechanism to control and monitor management behaviour. The internal system, referred to as corporate governance, serves to protect shareholders from the expropriation of wealth by rogue managers. By having such a mechanism in place, the role of monitoring and disciplining the agents could constrain opportunistic managerial behaviour (Fama, 1980; Shleifer and Vishny, 1986).

The corporate governance variables used throughout this study are CEO/chairman duality, board size, and the fraction of non-executive directors to executive directors of the firm. The data are manually collected from the directors' remuneration sections of the sample firms' annual reports following Conyon et. al.

(2009)

3.3.4 Control Variable

Some of the control variables are defined in this section.

3.3.5 Firm Risk

Firm risk is calculated following Guay (1999) to measure the volatility of the 36-month share price of a firm as the standard deviation of monthly stock returns over the research periodSeveral studies note that using stock return volatility to proxy for firm risk is common (e.g. Core et al., 1999; Coles et al., 2006).

3.3.6 Firm Size

With regard to firm size, firm net sales are used as the proxy. The data are obtained from Datastream. Logarithm values are used in the analysis for standardisation. As a control variable, the firm size normally used in testing includes total sales and total assets. For this study, the different usages of firm size are detailed as appropriate.

3.3.7 Cash Flow

Cash flow in this study is defined as earnings before interest, taxes, depreciation and amortisation minus capital expenditure and divided by total assets. The Datastream code is WC01201 for cash flow. There are three types of cash flow: operating, investing and financing cash flow.

3.4 Descriptive Statistics for Compensation

Table 3.3 presents the descriptive statistics for a sample of 183 publicly listed companies listed on the FTSE 350 from 1999 to 2008. The table shows the average total compensation as £5,872,649 with a range from £359,231 to £29,757,000 and a median of £3,676,388. CEO base salary has a mean of £595,090 and a median of £506,034. The average of share grants received is £1,807,626 with a median of £549,627. High option grants have an average of £1,184,728 and a maximum of £20.3 million. Conyon (1997) reports that average directors' pay is £254,000, a finding which is similar to this data set. The average pay for a chairman is £67,000 whereas other executive directors receive, on average, £126,000. In contrast, non-executive directors receive, on average, £38,000 per annum.

Table 3.3: Summary Statistics of Pay Components

This table presents the sample characteristics for 183 firms. The means of the variables are measured for 1999-2008. Variables are defined as toptions = total value of options granted, toptionsnew = total value of new options grants, tshares = value of shares, tltip = total value of LTIPs granted, tltipnew = total value of new LTIPs grants, and totalport = sum of salary, bonus, options, shares and LTIPs.

Variable	Obs	Mean	Median	Min	Max	Std. Dev.
salary	1674	595,090	506,034	11,654	2,903,000	537,399
bonus	1672	397,478	241,848	0	1,490,000	678,426
toptions	1329	1,184,728	349,965	0	20,351,000	2,333,191
toptionsnew	1314	219,854	9,337	0	11,766,000	787,782
tshares	1305	1,807,626	549,627	0	2,094,000	3,123,609
tltip	1329	1,350,467	564,457	0	19,239,000	2,050,789
tltipnew	1318	617,333	176,260	0	10,600,850	1,167,497
totalport	1674	5,872,649	3,676,388	359,231	29,757,000	5,532,175

The smallest and the largest CEO salaries across the nine industries were £475,427 and £879,327 respectively as shown in Figure 3.2. In addition, the industries which paid the highest salaries include oil and gas, telecommunications

and finance.

Figure 3.1: Distribution of CEO pay from 1999 to 2008

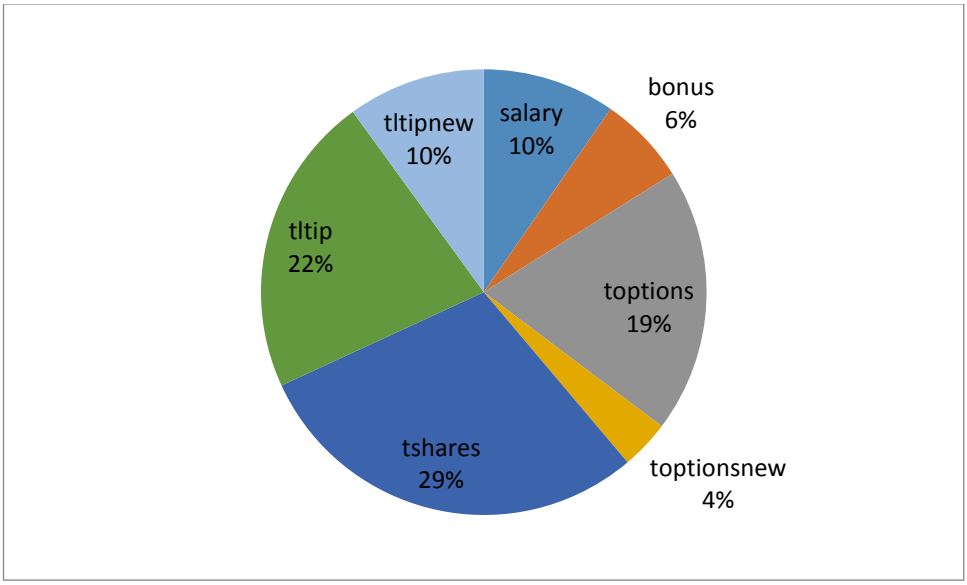


Figure 3.2: CEO compensation across industries from 1999 to 2008

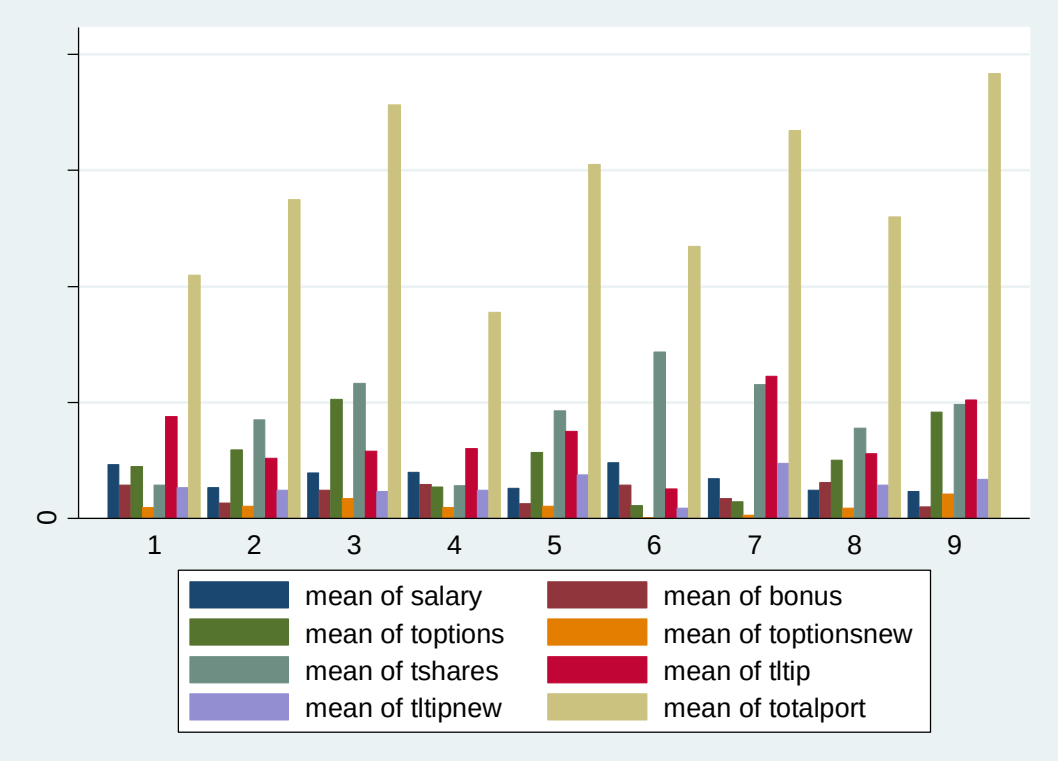


Figure 3.2 presents the average CEO compensation variables for different industry types. The highest paid CEOs were from the oil and gas industry and the lowest were from the hotel and restaurant industry. CEOs from the financial services industry received the highest salary compared with their counterparts. The lowest paid CEOs, from the retail industry, received about one-third of the total paid to CEOs from the oil and gas industry.

As demonstrated in Figure 3.3, the salary mean has gradually increased from 1999 to 2008 by around 42% from £432,094 in 1999 to £746,722 ten years later. However, bonus payments reached their peak in 2005 following an increase of 65.5% before a sharp decrease in 2006. Such payments experienced a slight increase of 9% in 2007 before plunging by 14.3% in 2008. The sharp downfall could be related to the global financial and economic crisis in 2007.

CEOs' non-cash compensations show some significant changes during the study period. As shown in Figure 3.5, firms increased their LTIP awards by more than five times from 1999 to 2007, that is, from £471,849 to £2,601,319. Because LTIPs are the second-largest pay component in CEOs' compensation packages, their popularity coincided with the decrease in share option awards from 2004 to 2008. UK firms moved from share option schemes to LTIPs in accordance with the Greenbury Report which states that when issuing new LTIPs, firms should replace, not supplement, existing stock option plans. These results suggest that firms tend to change their remuneration policies to comply with the Greenbury Report by replacing share options with LTIPs as long-term awards.

Figure 3.3: Trends in CEO compensation from 1999 to 2008

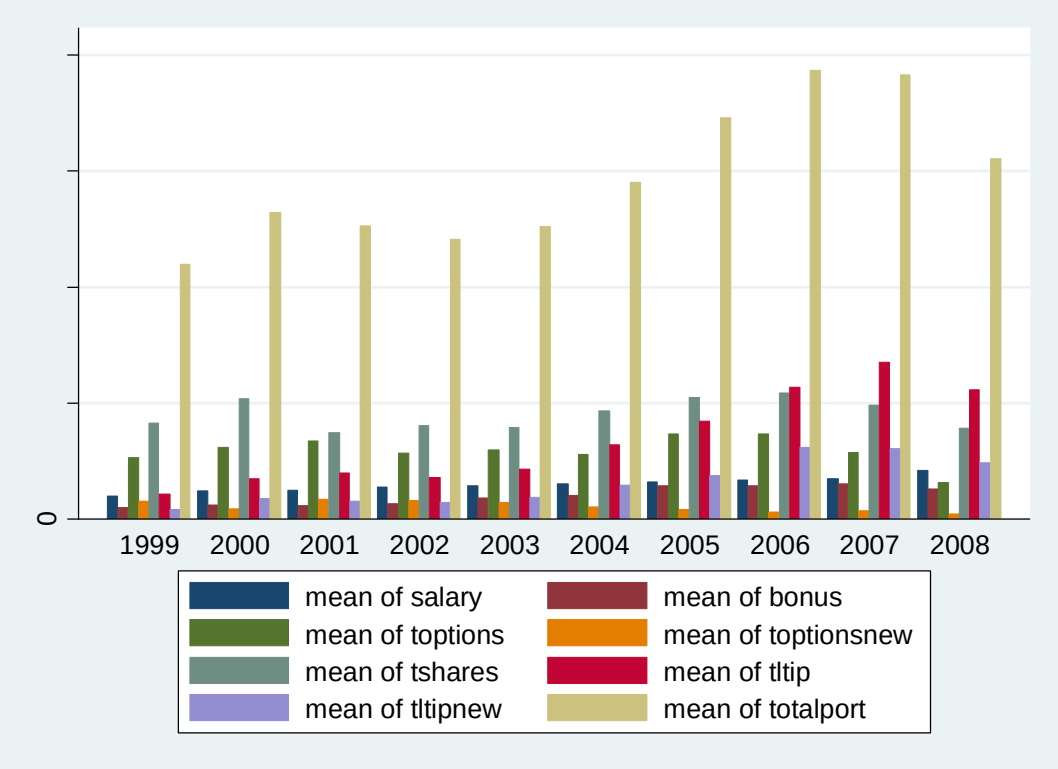


Figure 3.4: Trends in CEO salary and bonus from 1999 to 2008

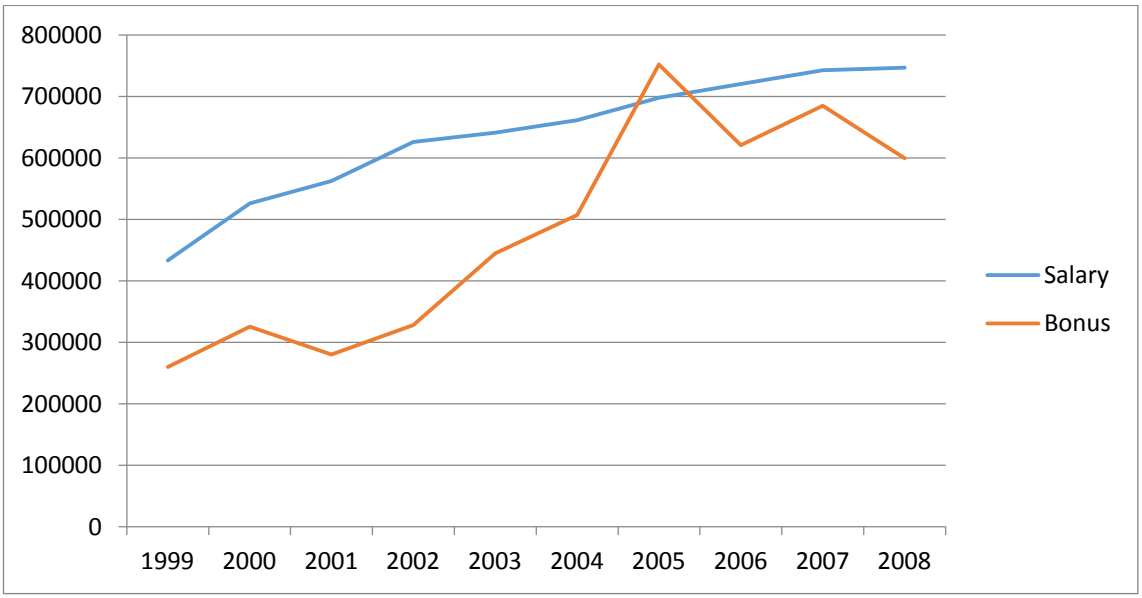


Figure 3.5: Trends in CEO equity compensation from 1999 to 2008

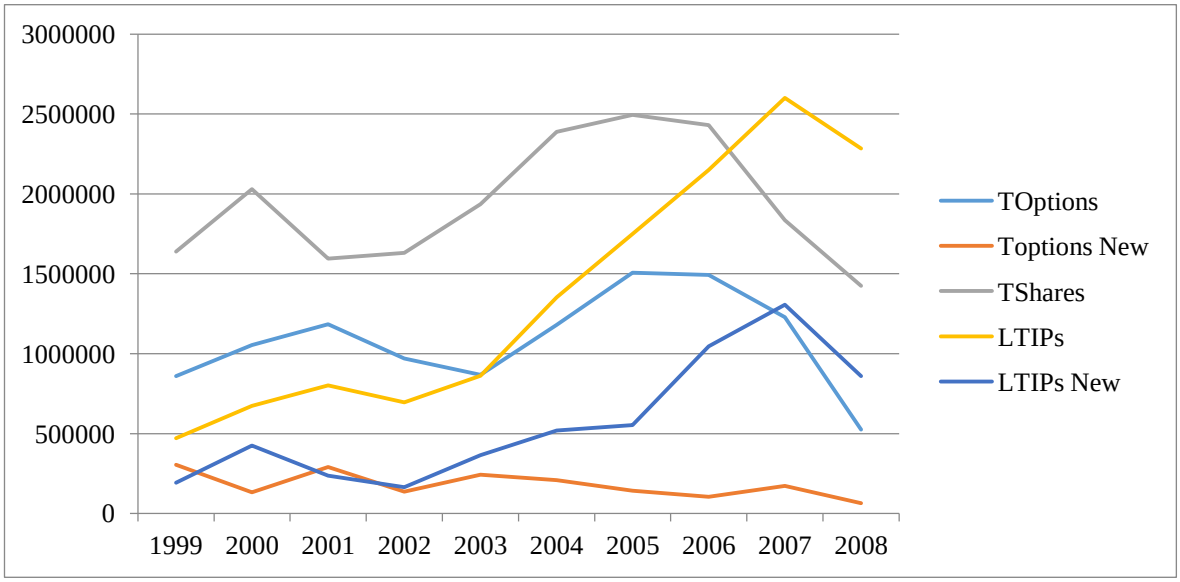
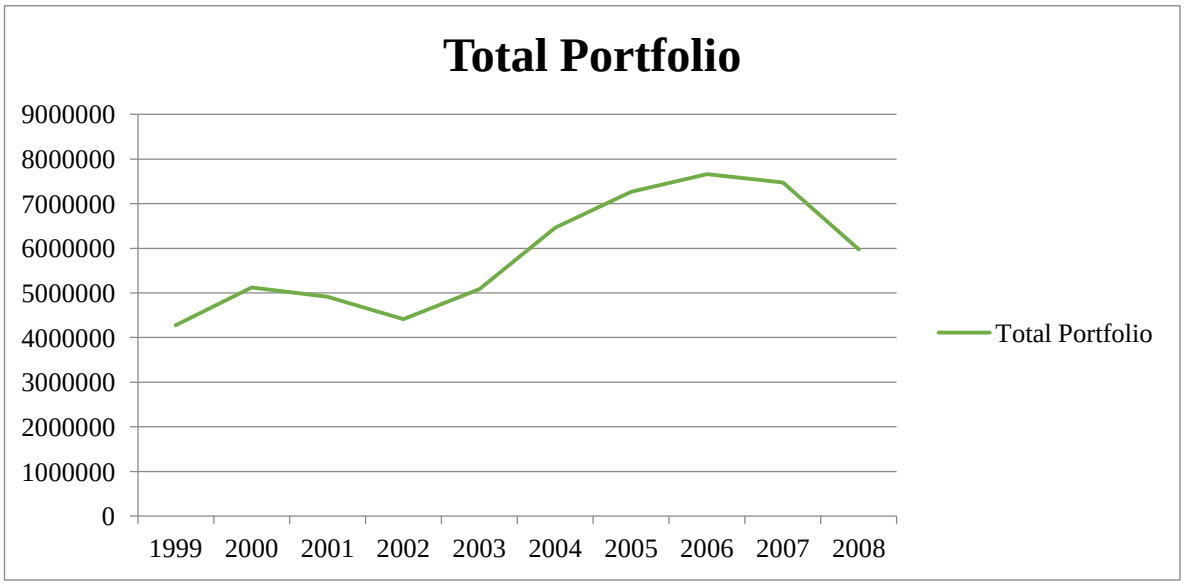


Figure 3.6: Trend in CEO total portfolio from 1999 to 2008



3.5 Analysis of Data

The statistical method of analysing the data is discussed in this section. For regressions using non-parametric testing, as used in Chapter 5 (payout), the panel regressions employ both univariate and multivariate analysis. The multivariate analysis is based on the Tobit regression model, and logistics regression as the estimation employs the winsorised 0 and 1 data on payout.

In Chapter 4, median regression is used following the study on pay-performance sensitivity by Ortiz-Mollina (2006). The extreme values or outliers are minimised by using the median of the sample's observations. Meanwhile, fixed effects regression is used to control for the heterogeneity of missing observations. This will ensure that unobserved data, which created the unbalanced data, do not negatively affect the sample size.

In Chapter 5, the method of analysis used is Tobit and logistic regression. The choice of such analysis follows the work of Fenn and Liang (2001) with the "one-sided Tobit models for dividends, share repurchases and total payouts censored at 0" (Fenn and Liang, 2001, pp. 58). This means that the censored regression model analyses data which has been left-censored, because the minimum payouts for firms will be 0 if no payouts are made.

Meanwhile, logistic regression is used to analyse the likelihood of payout for the payout dummy. The dummy is 0 if no payout is made and 1 when there are payouts made by the firms in the sample. The binary model tests the propensity of firms to give cash disbursements to shareholders in relation to the independent variables used for the model.

In Chapter 6, fixed regression is employed in order to estimate the effects of

CEO compensation on corporate cash holdings. The fixed effect model is an approach which estimates the fixed effect of predictors on the dependent variables by controlling for the constant variations coming from the omitted variables and for unobserved heterogeneity between groups over time. The assumption of this technique is that the individual specific effect is related to the regressors. The fixed effect approach works by removing much of the error variance which arises due to the distortions resulting from the individual differences among groups which come from the omitted variables or the unobserved heterogeneity which is correlated with the regressors.

3.6 Conclusion

This chapter has outlined the sample construction, the definition of key variables and the methodology used to examine the research. This study mainly uses two sources: Datastream for the sample firms' accounting data and annual reports for the compensation and corporate governance variables.

The explanations about the data and methodology are available in the specific sections in the respective proceeding chapters on pay-performance sensitivity, payout policy and cash holdings.

Chapter 4: CEO Pay-Performance Sensitivity in UK Companies

4.1 Introduction

The research objective of this chapter is to examine the relationship between CEOs' pay-performance sensitivity and firms' capital structure, focusing on equity incentives. Much of the past research on executive compensation has focused on aggregate pay measures. As a result, there are few UK studies which have analysed exclusively the relation between executive pay-performance sensitivity and capital structure (e.g. Ozkan, 2007; Florackis, 2009).

The main debate in the literature is that, as business owners do not necessarily contribute towards business management, company shareholders often like to be kept appraised in regards to corporate activities and policies. However, there is contention that executive compensation packages are designed to maximise managers' wealth rather than shareholders' value. For example, Bebchuk and Fried (2003) posit that managerial pay is the source of conflicts of interest. From this perspective, the principal-agent model examines the conflict of interest between principal (shareholders) and agents (managers) of public companies, the managers who are responsible to make decisions could take adverse business decisions that affect the shareholders' (principal) return. In order to provide incentives for the agent, contract alignment theory suggests that managers could be induced to take optimal actions when their compensation package is tied to firm performance. By offering high-powered incentives whereby executives' compensation is linked to a firm's

share price, managers will be more aligned with the shareholders' interest in maximising shareholder value.

Thus, contract alignment theory suggests that executive compensation contracts are designed by shareholders as mechanism to control managerial misbehaviour and promotes shareholders' wealth maximization interest. The incentives provided by compensation contracts induce managers to focus on actions that will increase shareholders' value. Predictions that suggest executive compensation is linked to firm performance is based on the agency model in the seminal work by Jensen and Meckling (1976) and later Holmstrom (1979). In this regard, this chapter aims to explore the relationship between CEO pay-performance sensitivity and capital structure. In particular, the research focuses on how firm leverage can influence CEO pay-performance sensitivity.

The main findings show that a firm's capital structure has little influence on determining pay-performance sensitivity. Using sample of 183 companies listed in the FTSE 350 from 1999 to 2008, results show considerable transformation in the structure of executive pay packages, especially after the recommendation by the Greenbury Report (1995). The estimates show mixed support for pay-performance and leverage because the negative coefficients for market debt have weak significance overall. It can be concluded that a firm's leverage has little influence on pay-performance sensitivity as a mechanism to align the interests of the CEO and debt holders of the firm. However, there is strong support for the hypothesis that CEO pay-performance sensitivity increases with a firm's growth opportunities, which suggests that firms award higher equity compensation to attract managers with more talent.

In this chapter, Section 4.2 provides a review of the literature. This is followed by development of hypothesis in Section 4.3, which also describes the data used and the methods of analysis. Subsequently, data analysis and empirical results are presented in Section 4.4. This is followed by Section 4.5 which provides summary on the research and conclusions.

4.2 Literature Review

It is an established view among finance scholars that managers have a tendency to pursue self-interest with minimal effort instead of focusing on activities that maximise shareholders' wealth. In order to align managers' and shareholders' interests, managerial compensation contracts are designed to provide incentives for managers to reduce moral hazards and increase shareholders' value (Holmstrom, 1979). However, prior literature provides mixed support for the contract alignment theory. For example, Yermack (1995) provides mixed evidence in his study about whether CEOs' pay-performance sensitivity increases with growth opportunities and decreases with firm leverage and CEO share ownership. Using data for 792 US firms from 1984 to 1991, Yermack (1995) uses a panel Tobit estimation to analyse stock options awards and prior variables. He finds that companies with growth opportunities, as measured by Tobin’s Q, award less stock-based incentives and have non-meaningful coefficients on firm leverage and CEO share ownership. He concludes that stock options provide little incentive to mitigate agency conflicts.

Core and Guay (1999) and Coles et al. (2006) provide support for stock option awards as an incentive alignment mechanism to mitigate the conflict of interest between principal and agent. Core and Guay (1999) report that firms with

better share price performance award more stock option grants to CEOs. Meanwhile, Coles et al. (2006) analyse pay-performance sensitivity (delta) to investment opportunities (R&D). and find that the coefficients are positive and significant for risk-taking incentives (vega). The vega is defined by Jensen and Murphy (1990) as dollar changes in CEOs' wealth for a 1% change in the standard deviation of returns.

However, Meulbroek (2000) argues that equity-linked compensation plans are suboptimal mechanism to induce managers to pursue shareholders' value maximization goals. According to the rent extraction hypothesis, a board of directors cannot design optimal compensation contracts because of personal interest. However, when CEOs control the pay-setting process, they are able to compensate themselves beyond the optimal limit (Bebchuk and Fried, 2003; Hanlon et al., 2003). A CEO has power to determine his pay; therefore, managerial pay design is limited to control agency conflicts. A board of directors also seeks personal benefits from appointments in terms of salary, social connections and so on. The directors may be biased in supporting the reigning CEO because of his nominating power for the board's re-election. Therefore, directors will design a suboptimal compensation contract to favour the CEO, a situation that is inefficient when it comes to reducing agency conflicts. In this regard, the empirical literature provides mixed evidence relating to determinants of pay-performance sensitivity. The aim of this study is to extend the executive compensation discussion regarding these determinants and the magnitude of pay-performance sensitivity.

4.2.1 Determinants of Pay-Performance Sensitivity

4.2.1.1 Risk

One of the principal-agent problems is managerial risk aversion. Managers are inherently risk-averse due to their undiversified human capital and because their wealth is tied to the firm. Shareholders are risk-neutral because they have diversified portfolios and are able to diversify firm risk. Because the purpose of the firm is to maximise shareholder value, which can be achieved when managers (agents) choose high return projects, regardless of their risks, in order to maximise firm value. Risk-averse managers tend to avoid risky projects with positive return to protect their wealth from future share price shock when they hold undiversified portfolio. . This approach penalized shareholders wealth maximization objectives and leads to an underinvestment problem (Guay, 1999). Underinvestment causes conflicts between risk-averse agents and risk-neutral principals because managers tend to avoid higher risk, and higher return, investments. When managers pass over higher return projects, shareholders' wealth will not be maximised.

According to agency theory, the risk pertaining to incentive compensation should reduce optimal compensation. Murphy (1999) and Rajgopal and Shevlin (2002) argue that stock options can be utilized by risk-neutral and diversified shareholders to provide incentives to encourage managers with low risk tolerant to invest in riskier but positive NPV projects. Managers are inherently risk-averse because they cannot diversify their human capital, and since shareholders can diversify their risk through their investment portfolios, they are risk-neutral. The shareholders' interest is to maximise their wealth by increasing firm value, and they seek to encourage risk-averse managers to align with their objective via

compensation contracts. Therefore, managerial risk aversion could be countered through better incentive to increase risk tolerance when pursuing future projects.

With regard to the risk-related incentive problem, several studies focus on stock options, restricted stock and LTIPs with inconclusive results (e.g. Amihud and Lev, 1981; Smith and Stulz, 1985). With regard to stock options, the value of options will increase with the share price and stock return volatility. The increase in share price offers an incentive to maximise firm value by taking positive NPV projects, and the increase in stock return volatility is an incentive to take risky projects. Lambert et al. (1991) use wealth effects and risk premiums to argue about managerial wealth expectations and risk aversion tendencies towards increasing pay-performance sensitivity. Jensen and Meckling (1976) model the convex pay-off of stock options and illustrate such options with a greater convex pay-off that provides a greater incentive to increase firm risk. The principal-agent model suggests a positive association between executive stock option and firm performance.

Several empirical studies on pay-performance sensitivity and firm risk provide inconclusive results on the association between delta and firm risk (Armstrong et. al., 2013). In their study, Core and Guay (1999) use delta as a dependant variable and regress against various firm characteristics. Using new shares, restricted shares and stock option awards, they test whether new grants of equity incentives have adverse association with entrenchment and whether the level of new equity incentives are negatively associated with new equity grants. They find mixed results overall but report high delta when stock options' value increases by $0.75 as share price increase by $1.

Later works by Core and Guay (2002) and Coles et al. (2006) provide support

for risk-incentive alignment when they find that delta is positively related to firm risk. Coles et al. (2006) study the relationship between CEO compensation and various financing policies and firm performance. They determine that higher pay-to performance sensitivity (delta) will increase managerial risk aversion when selecting projects. In contrast, they report that higher pay-performance sensitivity to volatility (vega) reduces managerial risk aversion. Duru et al. (2005) provide evidence that a higher proportion of a cash bonus will make a manager more risk-averse due to managerial concern about cash flow stability in a family controlled firm.

Alternately, Aggarwal and Samwick (1999) report that pay-performance sensitivity has negative association with firm risk. In their ordinary least squares (OLS) regression analysis on in-the-money options, they find that the regression coefficient on the cumulative distribution function (CDF) variance and performance is statistically and significantly negative. Lewellen (2006) argues that in-the-money options tend to discourage risk-taking. Similarly, Parrino et al. (2005) report that managerial risk aversion is affected by the choice between in-the-money or out of money stock options grants. This is because in-the money options are more sensitive towards the downward movement of share price and require a greater rate of return to offset riskier projects. Aggarwal and Mandelker (1987) predict that executive stock options will encourage managers to increase stock return volatility in order to increase their options' value. However, Lambert et al. (1991) argue that risk-averse CEOs cannot diversify their risk and prefer to take projects with less risk to protect from volatile share price movement. This is due to the effects of convex pay-off from stock options which provide a positive inducement for taking risky projects as in the money options will increase value when the volatility is high. When there is low

probability for options to be in-the-money, a small increase in stock return volatility does not decrease managers' pay-off on the downside because the expected share price will be below the options' exercise price. In the event that options strike price is in-the-money, managers' pay-off will face greater risk when the share price falls.

Several papers discuss the convex pay-off offered by stock options and restricted shares that is able to mitigate the CEOs' risk aversion problem and induce them to take risky projects with higher returns. Guay (1999) uses cross-sectional data by differentiating slope and convexity incentives of shares and stock options to examine the relationship between share price volatility and value of CEOs' stock and stock options. He illustrates that convexity underlying stock options value substitute for risk-averse CEOs' preference. Guay (1999) also reports that equity-based compensation provides managers with risk-taking incentives when facing significant potential loss from underinvestment.

Hall and Murphy (2002) contend that stock options could offer a suboptimal incentive for alignment of interest between managers and shareholders. This is because of the differences in the valuation of stock options between undiversified, risk-averse managers and risk-neutral shareholders who award the stock options. Because of features such as stock options (e.g. non-transferable, non-tradability and early forfeiture within vesting period), executives would demand higher risk premiums and value stock options less than the Black-Scholes valuation by the firm granting the stock options. Hall and Murphy (2002) analyse the pay-performance incentives provided by non-tradable options and find that executives at a higher risk-aversion coefficient would not benefit from convexity pay-off or concavity of utility function. Since executives' value line for options decreases with risk aversion, the

authors argue that risk-averse executives consider their holdings of non-tradable stock options have lesser value than the firm's projection. The valuation of options granted at the money will be worth 63.5% of their balance sheet (BS) value for a semi-diversified manager and with lower risk aversion. They show that another executive with higher risk aversion will value his stock options at 21% if 67% of his wealth is tied to the firm's performance.

4.2.1.2 Leverage

Another determinant for pay-performance sensitivity is firm leverage. Agency theory suggests that debt can affect the agency conflicts between managers and shareholders (Ortiz-Mollina, 2006). Use of debt financing may alleviate the strained relationship between managers and shareholders through external monitoring by capital market. This in return will diminish the need for high powered incentives in the form of managerial pay. Furthermore, Ortiz-Mollina (2006) posits that managers are more likely to manage the firms' resources to pursue profit bearing ventures in order to meet the debt repayment obligations and avoid forced liquidation. This theory predicts that when higher debt and high alignment incentives can be substituted, pay-performance sensitivity will be lower for a firm with higher debt.

Under this capital structure mechanism, the agency cost of equity due to conflict of interest between principal and agent will be lesser (Jensen and Meckling, 1976). By raising debt, managers have bonding contract for debt repayments and increases motivation to seek high return investment opportunities (Grossman and Hart, 1982). If debt is able to mitigate the manager-shareholder conflict, the agency cost of equity will be reduced in a higher levered firm. These firms will rely less on

high-level incentives. Following this intuit, agency theory predicts a negative relationship between managerial incentives as a proxy for pay-performance sensitivity and leverage (Ortiz-Mollina, 2006). Meanwhile, debt also acts as a monitoring mechanism and the agency cost of debt hypothesis expects that pay-performance sensitivity is lower for firms with higher executive pay in terms of stock option and defined benefit pensions.

John and John (1993) provide a theoretical model on the association between debt ratio and pay-performance sensitivity (via managerial ownership of stock and stock options). Their model considers whether a firm with high pay-performance sensitivity will have low debt. Secondly, they identify the influence of convertible debt where bond yield risk premium positively impact the executive ownership of stock and stock options. They predict that closely aligning managers' and shareholders' interests via managerial ownership could control the agency cost of equity but at the same time increase the agency cost of debt in terms of risk shifting tendencies from shareholders to bondholders and impose higher risk premiums in bond prices (Voulgaris, 2010). John and John (1993) illustrate that an increase in debt will cause pay-performance sensitivity to decline as an increase in risk-shifting tendencies reduces due to the diminishing role of managerial compensation contracts as an incentive alignment mechanism. In the presence of convertible debt, they expect that pay-performance sensitivity will be larger in a way owing to concavity of debt mitigating the risk-shifting tendencies of managers.

Ortiz-Mollina (2006) provides empirical support in an investigation of the John and John (1993) model for 1,652 CEOs from 1993 to 1999. Using Aggarwal and Samwick's (1999) measurement for pay-performance sensitivity (delta), the 2-

stage least absolute deviation (2SLAD) regression results show that pay-performance sensitivity statistically and significantly lower in book leverage and market leverage. Ortiz-Mollina (2006) argues that debt reduces dependency on high-power incentives (in stock or stock options) when there is monitoring by bondholders and avoids the free cash flow problem. With regard to convertible debt and straight debt in the firm's capital structure, Ortiz-Mollina (2006) reports that sensitivity is higher at $11.58 for firms with a mix of straight and convertible debt, and only $10.18 for firms with straight debt only. This study will extend Ortiz-Mollina's model by including CEO cash and equity compensation in the analysis.

Other non-direct empirical support is provided by Kabir et al. (2013) using data from UK firms. In contrast with Ortiz-Mollina's (2006) approach, Kabir et al. (2013) examine the level of compensation structure and the cost of debt for 150 firms from 2003 to 2006. They find that performance vested stock options (PVSOs) will increase the cost of debt to a firm compared with traditional stock options without a performance target. Their investigation provides no evidence of the association between restricted stock and cost of debt.

Another theoretical model by Douglas (2006) focuses on debt as an instrument to align manager-shareholder interest and mitigate shareholders' opportunism. By choosing an optimal debt level, incentive conflicts between managers and shareholders are mitigated. Using a two-period model, Douglas (2006) illustrates that within a firm with an asset substitution problem, legally and lengthy debt covenants required higher efforts and costs to be amended compared to executive compensation structure packages. Additionally, it serves as an incentive alignment mechanism through timely debt payment from the firm's future earnings.

In order for the firm to avoid the underinvestment problem because of shareholders' opportunism, debt acts as a commitment for shareholders to design optimal executive contracts. Therefore, Douglas (2006) predicts that debt is negatively relates to pay-performance sensitivity. Secondly, pay performance has positive association with investment opportunities.

Similarly, an earlier model combining optimal managerial contracts and debt levels to induce efficient first-period firm value maximisation is developed (Dewatripont and Tirole, 1994). In their model, managers' investment choices depend on compensation contracts enforced by shareholders and monitored by lenders. The asset substitution problem will be lower and reduce firm risk. However, an ex-ante period will impose the shareholder opportunism problem; therefore, optimal compensation contract design and debt policy ensure the incentive alignment impact as debt level reduces asset substitution and compensation contracts provide pay-performance dependency.

Other studies also contend that debt plays a significant role in shareholders' value creation and limit managerial private interests. Using a free cash flow model, Jensen (1986) argues the benefits of debt issuance in constraining managers from pursuing a self-interest agenda at the expense of firm value maximisation through debt payment and avoiding wasteful investment in inefficient projects. When free cash flows increase the likelihood of an agency cost of debt, debt can act as a disciplinary tool to constrain the managers' discretion, encourage efficient investment decisions and restrict self-interest projects that increase bankruptcy threats (Harris and Raviv, 1990).

Zwiebel (1996) argues that debt helps entrenched managers to limit their

empire-building activities. Specifically, debt increases the likelihood of bankruptcy and takeover threats, which are unfavourable for entrenched managers. Therefore, imposing debt by ex ante creditors refrains them from investing in risky projects which would jeopardise the firm's current and future cash flow. Under this dynamic capital model, debt is only effective when the targeted debt level predicts the outcome of the bankruptcy cost, which is tied to the likelihood of project failure. Using a two-period model, when debt is introduced ex-ante, managers are more likely to avoid investing in bad projects when the bankruptcy cost is high. During the second period, the debt policy and dividend payout ensure that managers do not waste cash flows in other risky projects.

Morellec (2004) also uses the dynamic capital model to illustrate that debt induces managers to focus on shareholders' wealth maximisation rather than pursuing personal agendas. However, the model uses a comprehensive setting of taxes and bankruptcy threat to predict that the optimal leverage level will be low for firms with high pay-performance sensitivity. Similarly, Cadenillas et al.'s (2004) dynamic capital model shows that the optimal leverage level will be low for firms with higher pay performance based on the firms' risk volatility.

Debt also acts as a disciplinary tool to curb suboptimal business decisions and increase shareholders' wealth. Stulz (1990) shows how the utilization of debt reduces the available free cash flows in the firm which helps to avoid overinvestment and restricts management opportunism (Hart, 1993; Hart and Moore, 1995). Other research point out that managerial self-interest also adds to the agency cost. Shleifer and Vishny (1989) argue that managers choose investment projects that serve to increase their talent and specific skills. These investments increase firm value and

reduce the probability of firing the managers, allowing them to command higher pay packages and possibly become entrenched.

4.2.1.3 Investment Opportunity

According to Myers (1977) and Smith and Watts (1992), companies with large 'growth opportunities', will generate expected profits from future investments to increase firm value. Myers (1977) discusses the underinvestment problems due to conflicts of interest between shareholders and bondholders. When a firm has many investment prospects, managers may act to increase the firm's value. This may lead to asset substitution problem as future investments in high return projects require large external financing and increase the likelihood of failure to meet the debt repayment. The model predicts a negative relationship between assets in place and debt. Another branch of literature focuses on the underinvestment problem due to information asymmetry. Bizjak et al. (1993) argue that a firm with high investment opportunities relies on managerial compensation to alleviate the information asymmetry between managers and shareholders. Managers obtain insider information on the investment opportunities available. Using a two-period model, the authors posit that markets will observe the cash flow of the second period from investments placed in the first period, thus reducing information asymmetry. Risk averse managers may be induced to greater risk taking using stock options grants which encourage them to invest in higher risk, but positive, NPV projects. Since underinvestment is not more preferable than overinvestment for shareholders, managers may try to manipulate share price performance and invest in value destroying projects. To mitigate this problem, managerial compensation is designed to link with short term and long term performance target. Therefore, the authors

predict that firms with high investment opportunities rely on convex incentives offered by stock option awards. Bryan et. al. (2000) emphasize that stock options protect risk-averse managers from the risk of losses while providing a high upside gain potential. By linking stock option grants with the nature of the assets in place, pay-performance sensitivity is predicted to have positive relationshipwith investment opportunities.

Several authors contend that investment opportunities influence the setting of managerial compensation. By adding the convex payoff into the compensation structure, managerial risk aversion can be reduced in order to pursue higher return projects at higher risk (Smith and Watts, 1992). They predict a positive relationship between investment opportunities and managerial stock options. Similarly, Bizjak et al. (1993) predict that firms with high prospective projects opt for performance-linked equity-based compensation in order to alleviate information asymmetry. These authors point the needs of using such compensation due to increase in opaqueness where managers perform projects evaluation and selection may not be entirely disclosed to the board of directors. By linking equity compensation with performance target, the shareholders preference for high value and riskier projects are met as the managers are assessed more on the share price performance. The empirical studies on stock options grants provide inconclusive results. Several studies in the 1990s report that stock option grants are negatively linked to investment opportunities (Bizjak et. al., 1993; Yermack, 1995). Using the ratio of firm value to the book value of assets and the ratio of R&D expenditure to total assets, Bizjak et al. (1993) test the type of equity compensation grants for high growth firms if the choice lean on stock options and less restricted stocks than firms

that primarily have high assets in place because of the information asymmetry regarding the development of new products. They find that the cash compensation (salary and bonus) and also total compensation reduces with investments availability where they present results of the incentives as negative and significant coefficients. Similarly, Yermack (1995) finds no support for the hypothesis that stock option grants are higher in firms with high investment prospects when he investigates whether Tobin's Q has a positive relationship with new stock option grants for CEOs between 1984 and 1991. Using a Tobit model analysis, he finds that pay-performance sensitivity of CEOs' new stock option grants is negatively related to growth opportunities and that there is only a weak relationship between overall mix of compensation and Tobin's Q.

In contrast, other studies prove the positive relationship between investment opportunities and equity compensation incentives (Lewellen et al., 1987); Smith and Watts,1992; and Bryan et al.,2000 According to Lewellen et al. (1987) , stock-based compensation alleviate misalignment of interest between managers and business owners as managers wealth are tied to the firm's share price performance and increase their risk appetite when pursuing projects. Using after-tax compensation and the market-to-book value of equity, the results show negative coefficients for salary and bonus. However, they find support for shareholders' preference to award equity-based compensation to prevent suboptimal investment choices when they report significant and positive results the test of relationship between share price return variance and the firms' debt to equity ratio.

Guay (1999) examines whether firms provide stock options grants to managerial pay order to increase investments in riskier projects with higher return

and mitigates the managerial risk aversion in selecting future investments. Guay (1999) specify book-to-market, R&D expenditure and capital expenditure as the investment variables. His findings provide support to the risk aversion reduction incentives as the results show a positive relationship between vega and firm size, investment opportunities and R&D expenditure.

In other study, Coles et al. (2006) examine pay-performance sensitivity (delta) and CEOs' wealth sensitivity to stock volatility (vega). By differentiating between delta and vega, they argue that more precise measures on managerial incentives can be tested. They predict that higher vega increases R&D activities and provides support to their hypothesis when the results show a positive coefficient on vega.

4.2.1.4 Ownership Structure

Another strand of literature examines the association between ownership structure and pay-performance sensitivity. When there is a separation between ownership and control of a modern firm, the different types of ownership by managers, family and institutional shareholders have provided numerous insights to the pay-performance sensitivity field. The focus on managerial ownership and firm performance is of special interest for this research.

The dispersion of ownership when managers are delegated for decision making in the firm makes the monitoring of managers' behaviour an insurmountable task. When managers have the authority to run the business, they have discretion and a substantial amount of control of day-to-day operations (Fama and Jensen, 1983). Because of the decoupling of ownership and control, a misalignment of objectives between managers and the firm’s shareholders will exist (Ozkan, 2004). In the case

of the principal-agent problem, managers act as utility maximisers and seek to gain personal wealth through managerial perquisites. Managers tend to extract rent in the form of managerial perks such as a luxury office, golf club membership and so on. They are more likely to spend less effort on maximising firm value through long-term planning and investment.

Jensen and Meckling (1976) propose the element of managerial ownership reduces the friction between managers and shareholders by aligning their interests through equity-based incentives because managers have a higher incentive to maximise shareholders' value. They suggest that by holding share ownership in the firm, managers are forced to act in line with shareholders' value maximization objectives as their personal wealth is tied to the firms' value. They predict that with an increase in managerial equity ownership, managers are restrained from using the company resources for their own personal perquisites and have incentives to increase the firm value through share price appreciation. Under this 'convergence of interest' hypothesis, firm value will increase with managerial equity ownership.

However, several studies argue that there are trade-off costs associated with having substantial managerial equity ownership. According to Fama and Jensen (1983), the divergence from ownership and corporate control achieve it means when the principal and agent are drawn in a contractual agreement to fulfil each party's objectives. The authors argue that higher managerial ownership will give greater control and voting rights for residual claims and decision-making when managers bear the wealth effects of their decisions. With greater control and significant voting rights, managers could have more influence and avoid disciplinary actions from external markets. When granted a small stake in the form of equity ownership,

market discipline from external monitoring will ensure that managers take actions to maximise firm value.

Stulz (1988) illustrates the non-linear association between managerial shareholding and corporate value. He argues that in the presence of a takeover threat, higher managerial ownership will deter the control challenge because managers have an increased premium over bidders. Therefore, he predicts that managerial equity ownership will increase when CEOs face takeover threats. However, when managerial shareholdings exceed a certain level, the probability for takeover attempts will be significantly reduced, thereby reducing the firm's share price. The author concludes that at a lower level of managerial equity ownership, managers will be aligned with the shareholders' interest to avoid takeover challenges and increase firm value maximisation, hence the incentive alignment effects. However, when managerial shareholdings increase above the optimal level, managers become entrenched and could avoid disciplinary action from control challenges made by outside markets, thereby reducing firm value.

However, prior literature documents mixed results regarding the association between managerial shareholding and firm performance. For example, Morck et al. (1988) argue that managerial ownership has a non-linear relationship with a firm's performance which is measured by Tobin's Q. They find support for the hypothesis that at a lower level of ownership, managers tend to be aligned with shareholders' value maximisation goals. However, managers become entrenched after their share ownership exceeds 5% where high share ownership increases agency conflicts between managers and shareholders.

In contrast, the studies on US firms during 1990s report insignificant

relationship between CEO ownership and pay-performance sensitivity (Jensen and Murphy, 1990; Yermack, 1995). They conclude that CEO ownership has little effect over pay-performance sensitivity.

4.2.1.5 Corporate Governance Mechanism

The divergence between ownership and corporate control may attribute to the friction in agency relationship (Ozkan, 2004). According to Fama and Jensen (1983), monitoring by the board of directors creates a corporate governance mechanism which aligns managers' and shareholders' interests. Since the board of directors has the power to appoint a CEO and top executives, sack employees, and design compensation packages while also setting business goals and monitoring the firm's operation, an effective board of directors could lead to higher pay-performance sensitivity.

Hermalin (2005) argues that a firm with a diligent board of directors will recruit an effective CEO and demand greater productivity in order to increase firm performance. In order to encourage greater productivity, CEOs are incentivised through their pay packages. The author predicts that CEO compensation is positively related to strong presence of board of directors. In contrast, Bebchuk and Fried (2003) argue that a weak board leads to greater CEO compensation. Under their managerial power theory, the CEO has the power to determine his pay; therefore, managerial pay design is a limited means of controlling agency conflicts. Moreover, the board of directors also seek personal benefits from their appointments in terms of salary, social connections and prestige. Thus, they could be biased in supporting the reigning CEO because of his nominating power for the board’s re-election.

Therefore, directors will design a suboptimal compensation contract to favour the CEO which is inefficient at monitoring the CEO's efforts.

Prior literature examines the structure and effectiveness of boards of directors. Empirical studies provide mixed evidence about the board size effect on firm value. Yermack (1996) documents that Tobin's Q decreases when there are more than six directors on board. He finds that board fiduciary roles become more problematic when board size increases and where the Tobin's Q decreases by 0.23 when the board size doubles. However, Coles et al. (2008) show Tobin's Q as proxy for firm performance has a U-shaped relationship with board size in accordance with firm characteristics. They report that Tobin's Q is positively associated with the number of directors on board in firms with structured hierarchy, but negatively related to board size in other companies which do not have extensive advising needs. They argue that the U-shaped relationship is due to the proportion of external directors with greater expertise to fulfil their advisory role to the firm.

Several studies argue that the board structure mix (internal and external directors) influences performance. However, the dual role of a CEO as a CEO and chairman of the firm's board could stifle the directors' effectiveness due to agenda conflicts. Fama and Jensen (1983) suggest that executive directors have more influence than external directors in the firm's decision making role. However, this notion is refuted when Hermalin and Weisbach (1991) test on the fraction of external directors and firm performance produce insignificant results. They attribute the findings to the board bias as the directors tend to be selected by the CEOs and could also have their own interests which deviate from shareholders' wealth maximization goals.

4.2.1.6 Liquidity

Fazzari et al. (1988) argue that a shortage of free cash flow in a firm leads to underinvestment and hypothesise that liquidity or internally generated funds are important determinants for investment. Meanwhile, the opposite effect occurs according to Jensen (1986) in that excess free cash flow will create an overinvestment problem when managers invest in riskier projects with negative returns. Managers are assumed to reinvest available free cash flow, which in essence will maximise shareholders' wealth when the investment opportunities are high and managers select successful projects. However, if managers do not have free cash flow, they will not overinvest because of the monitoring by the external market if they raise debt to fund their investment.

Underinvestment is a problem for shareholders because managers tend to avoid risky but high return investments, a circumstance which is not aligned with the shareholders' goal of value maximisation. According to Myers and Majluf (1984), when facing a liquidity constraint, firms will avoid projects with positive NPV because of the inflated cost of external funds, whereas the managers view the cost of internal funds as cheaper when financing their future investment choices. In order to increase investment, Garvey (1997) provides a model whereby the free cash flow model uses incentive contracts to tie managers' wealth to firm performance. Managers are assumed to hold insider knowledge on the company's future projects and select profitable ventures based on performance-linked compensation plan. . Garvey (1997) proposes that by using a financing choice of debt over equity and a compensation structure to resolve the free cash flow problem, firms could align managers' and shareholders' interests with regard to information asymmetry and the

management of cash flow risk.

A survey of compensation literature by Murphy (1999) suggests that equity-based compensation acts as incentive alignment mechanism to reduce the friction of interests in agency relationship. Yermack (1995) points out that besides providing an incentive, stock options also represent a substitute for cash compensation, which is an economical way for firms which face financial constraint. Because equity-based compensation such as stock options conserve cash until they are exercised, empirical literature predicts that firms with liquidity constraints award more equity-based compensation than cash compensation (Yermack, 1995; Bryan et al., 2000).

Prior empirical studies provide mixed results about the liquidity constraint hypothesis. For example, Yermack (1995) reports positive and significant association between stock option awards and liquidity constraint. Using dummy variable to identify firms which do not pay dividends (zero dividends) to the shareholders at the year-end of sample firms, he estimates that non-dividend paying firm will shift towards paying more equity incentives than cash compensation such as salary and bonus. He notes that the ratio of cash to equity-based compensation almost doubles in firms without dividend payouts.

In contrast, Matsunaga (1995) measures liquidity as working capital in order to study the liquidity effect when firms use stock option awards to conserve cash. When controlling for leverage and liquidity to test the free cash flow effect, he finds that because stock option exercises provide cash inflow and stock appreciation rights (SARs) provide cash outflow, firms use stock options to boost short-term income strategy. However, there is only weak evidence that firms use stock options for an income-increasing management strategy.

Bryan et al. (2000) study the liquidity constraint on stock options and restricted stock. They find positive and significant relationship between firm's liquidity and stock options grants. Using firms' free cash flow which is derived from operating cash flows less investing cash flows over market value as a measurement for liquidity, they report that the coefficients on free cash flows are significantly negative for both sample of S&P 500 firms and non-S&P 500 US firms. Similar findings are reported by Core and Guay (1999). Their results show that illiquid firm's award stock based compensation and stock options when there is a shortfall in earnings.

Another study by Yilei (2007) examines the effects of debt and incentive compensation on free cash flows based on Garvey's (1997) theoretical model. Yilei (2007) argues that debt and incentive compensation act as substitutes because each has its own control mechanism to alleviate the friction of interest in agency relationship. While debt can serve to avoid the overinvestment problem, the underinvestment problem, which arises from information asymmetry for high-growth firms with more potentially profitable investment opportunities, will also be affected by disciplinary actions from bondholders. The author tests the hypothesis that free cash flow is positively related to equity-based compensation where share incentives are used to curb the overinvestment problem, and to see whether investment-cash flow sensitivity increases with managerial incentives (the financial constraint hypothesis). Using CEOs' compensation data from 1993 to 2004, he defines the free cash flow variable as discretionary internal funds after interest, taxes and dividend payments deflated by beginning-of-year capital. The coefficients on leverage show significantly negative results and are positive and significant on stock options with

regard to investment-cash flow sensitivity. He concludes that because debt constricts free cash flow, firms with abundant investment prospects award stock option compensation for incentive alignment between managers and shareholders.

4.2.1.7 Firm Size

According to Demsetz and Lehn (1985), firm size is expected to have negative association with stock-based compensation. Baber et al. (1996) use total assets and the market value of equities to test whether firm size affects pay-performance sensitivity which yoeld positive and significant results. In later study, Core and Guay (1999) use the logarithm of sales as a control variable for firm size. They report that the coefficient on the market value of equity is negative for their Jensen and Murphy (1990) model.

Another study by Ozkan (2011) uses firm size (measured by firm's sale) as a control variable and growth opportunities (which are measured by Tobin's Q). The regression results show a positive relationship between CEO compensation and firm size which is consistent with a prior study by Jensen and Murphy (1990).

4.2.2 Summary

Although the literature on contract alignment theory is vast, there are few studies which focus on the agency cost of debt-based explanations for pay-performance sensitivity. Ortiz-Mollina (2006) documents that debt affects the pay-performance sensitivity of the firm, suggesting a link between the capital structure of the firm and CEO pay-performance sensitivity.

4.3 Research Methodology

4.3.1 Research Aim

Prior empirical studies on executive pay packages have utilised American data or focused on American contexts. Consequently, the UK data provides different context to explain the determinants of pay-performance sensitivity. Therefore, due to the shortage of executive compensation based on UK evidence as noted by Ozkan (2004), the present study will focus on UK firms and practices

Much of the past research on executive compensation has focused on aggregate pay measures. As a result, there are few UK studies which have analysed exclusively the relation between executive pay-performance sensitivity and debt using several measures of pay-performance sensitivity. Evidence also indicates a shortage of UK research that examines the association between capital structure and performance targets (Ozkan, 2004; Ozkan and Ozkan, 2007).

4.3.2 Variable Descriptions

The data are obtained from companies' annual reports from 1999 to 2008. UK stock exchange rules require companies to disclose this information following the Greenbury Report (1995). The data are based on a time series of firm years from 1999 to 2008. It is anticipated that this contemporary data will reflect and accommodate the many political and economic changes which have occurred in the past decade. The construction of panel data allows for more rigorous econometric regression testing, and the survivorship bias is reduced by including firms with a minimum listing of five years during the sample period.

DataStream is used to generate data to measure stock-return volatility,

dividend yields and the market value of equity. Total annual compensation is calculated as the sum of salaries, bonuses, other annual compensation, the value of long term incentive plans (LTIPs), the value of LTIPs awarded during the year, the Black-Scholes value of new stock options granted during the year, and all other compensation paid to the CEO of the firm following Ortiz-Molina (2006).

Literature on stock options recognises the pay component as an incentive to induce managers to higher risk-taking for the firm (Jensen and Meckling, 1976; Guay, 1999). Babenko (2009) considers the convexity pay-off of stock options where managers are induced to increase risk-taking when their wealth is tied to the firm via stock option grants. Guay (1999) shows that the volatility of stock returns are of a higher magnitude following changes in stock option holdings compared to common shareholdings by using a study of the compensation packages of 278 CEOs of US companies from 1988 to 1993.

Yermack (1995) uses data from 792 US companies from 1984 to 1991 to study pay-performance sensitivity. The research implicitly uses stock option grants to test the relationship in several agency cost settings. The result finds that stock option grants are lower in heavily regulated industries. Prior studies have categorised stock option awards into traditional stock options and performance-vested stock options (Johnson and Tian, 2000; Kuang, 2007; Kabir et al., 2013). Traditional stock options have no specific performance criteria attached to them which is applicable to the latter type prior to the vesting of options. Studies by Johnson and Tian (2000) and Kabir et al. (2013) find that performance-vested stock options induce higher risk-taking among managers compared to traditional stock options.

Hall and Murphy (2002) contend on the notion of stock options are granted in

order to motivate managers to take higher risks and to distinguish performing managers from non-performing managers. The authors show that the stock options value is higher than the cost due to the restriction on trading the stock option awards in the market. Lambert (1991) shows that the value of options will decrease as the risk aversion level increases and when the total wealth in the firm increases.

For control variable, firm net sales are used as the proxy for firm size. Logarithm values are used in the analysis in order to control for extreme values and ensure that the results remain unbiased. Measures of corporate governance are indicative of powerful and entrenched executives and include CEO/chair duality in order to evaluate executive power following Wade et al. (1990) and Rechner and Dalton (1991). The proportion of non-executive directors (NEDs) to internal directors is used to assess corporate control (Beatty and Zajac, 1994) and board size as a commonly used indicator for quality of governance (Jensen, 1993).

Firm risk is calculated from the volatility of the 12-month share price and 36-month share price of the firm, that is, the standard deviation of monthly stock return over the period following Lee (2010).[1] Stock return's volatility is commonly used as proxy for firm risk (Core et al., 1999; Coles et al., 2006; Kin, 2008). For leverage, two measures are used: book leverage and market leverage following Ortiz-Mollina (2006), and are calculated by dividing the corporate debt with total assets. Firm leverage is calculated as the ratio of the book value of total debt to the book value of total assets following Yermack(1995) and Brick et al.(2006); using data from year 1999 to 2008.

[1] The 12-month share price volatility is calculated as the standard deviation of daily returns for 12 months prior to the sample year. The 36-month share price volatility is calculated for the three years prior to the sample year.

Listed companies are required to report the directors' annual remuneration packages. The data obtained are annual salary and benefits, bonus, shares, stock options and long-term incentive plans (LTIPs). Since the data are hand-collected for 183 companies from the FTSE 350, they have the distinct advantage of accuracy and are able to construct a relatively large number of firm-year observations. This makes it possible to use panel data analysis across industries, which is important because most prior studies use longitudinal data to examine executive pay.

This research adopts a time-series sampling of firms by selecting a sample from a much larger group, that is, the entire population of large companies in the UK. This comprises 350 companies listed on the FTSE 350 index. The rationale behind this selection is because the sample consists of a wide range of large corporations which are distributed across the UK and which operate in various industries and market sectors. This makes a substantial size for the sample, which is likely to increase the probability of the sample being representative of the population. By taking a panel data approach, the in-depth analysis of regression is able to explain the variability in the longer term compared to a single time period. It is also noted that companies which are listed on the FTSE have an obligation to publish annual reports, thereby making access to the required data more feasible.

The sample consists of 183 publicly traded companies listed on the FTSE 350. Financial institutions such as pension funds and unit trust companies are excluded from the sample due to the nature of the firms which have few employees, massive financial assets and boards made up entirely of non-executive directors. The data include remuneration details relating to the boards of directors, including CEOs and chairmen. All these variables are extracted from company annual reports from

1999 to 2008. The firms in the sample cover most sectors of the economy and are the most highly represented companies.

Data were analysed using statistics data analysis (STATA) 11. Where appropriate, variables are expressed in the natural logarithm of their values to adjust for the non-normality of distribution such as firm size, board size and portfolio equity. There are two stages to the analysis. The first stage is descriptive analysis, which highlights and illustrates graphically some of the associations among the variables. The second stage involves panel regressions. Both univariate (i.e. pairwise correlations) and multivariate analysis are used. Multivariate analysis based on median regressions is mainly employed to test the research hypothesis. As part of the robustness check, pooled ordinary least squares (OLS) are used.

Multiple regression is used for prediction as well as explanation (Lewis-Beck, 1993). It offers a "*fuller explanation of the dependent variable since few phenomena are products of a single cause, and ensures that the effect of a particular independent variable is more than certain, because the possibility of distorting influences from the other independent variables is removed.*"(Lewis-Back, 1980, pp. 47). Fundamentally, the multiple regressions hold the other independent variables constant through statistical control as opposed to experimental control. In panel data regression, the availability of more data points to an increase in the degree of freedom, which in turn reduces the collinearity problem among predicting variables provides better explanation on the econometric estimates (Byungnamlee, 1996).

4.3.3 Development of Hypotheses

4.3.3.1 Firm Risk

According to agency theory, the risk pertaining to incentive compensation should reduce optimal compensation. Murphy (1999) and Rajgopal and Shevlin (2002) regard stock options as an incentive to motivate managers with low risk tolerant to increase their risk appetite by selecting riskier and more profitable investments. Managers are inherently risk-averse because they cannot diversify their human capital, and because shareholders can diversify their risks through their investment portfolios they are not as risk conscious as the managers.

With regard to the risk-related incentive problem, several studies focus on stock options, restricted stock and LTIPs with inconclusive results. With regard to stock options, the value of options will increase with the share price and stock return volatility. The increase in share price offers an incentive to maximise firm value by taking positive NPV projects and an increase in stock return volatility is an incentive to take risky projects. Lambert et al. (1991) use wealth effects and risk premiums to argue that managerial wealth expectations and risk aversion tends towards increasing pay-performance sensitivity. Jensen and Meckling (1976) model the convex pay-off of stock options and illustrate that stock options with greater convex pay-off provide a greater incentive to increase firm risk. The principal-agent model predicts a positive association between pay-performance and risk.

H1: Positive relationship can be observed between pay-performance sensitivity and risk of the firm.

4.3.3.2 Leverage

Another determinant for pay-performance sensitivity is firm leverage.

Agency theory illustrates the utilization of debt can affect the friction of interest between the contracting parties in an agency relationship. Debt will encourage lenders to monitor the firm, and put constraint on free cash flow which must be utilized efficiently by managers in order to meet the debt obligations. This theory predicts that when higher debt and high alignment incentives can be substituted, pay-performance sensitivity is lower in companies with higher debt compared to companies with lower debt

John and John (1993) provide a model to associate the debt ratio to pay-performance sensitivity (via the managerial ownership of stock and stock options). They test whether a firm with high pay-performance sensitivity will have low debt and whether the presence of convertible debt in a levered firm will results in positive association between the risk premium and executive shareholding and stock options holdings. The authors predict that the close alignment of managers' and shareholders' interests via managerial ownership could mitigate the agency cost of equity. However, this may exacerbate the agency cost of debt due to risk transfer from shareholders to bondholders and higher risk premiums in bond prices (Voulgaris, 2010). John and John (1993) illustrate that an increase in debt will cause pay-performance sensitivity to decline because an increase in risk shifting tends to reduce due to the diminishing role of managerial compensation contracts as an incentive alignment mechanism. In the presence of convertible debt, the authors expect the pay-performance sensitivity to be larger because the debt's concavity element protects against risk shifting tendencies of managers.

H2: Leverage is a decreasing function for pay-performance sensitivity.

4.3.3.3 Investment opportunity

According to Myers (1977) and Smith and Watts (1992), high growth companies with abundance of investment opportunities will increase future firm value. Jensen (1986) proposes the model of a firm with high free cash flow will hold high debt level to constraint managerial expropriation of excess funds when lacking in investment opportunities.

H3: Positive relationship can be observed between pay-performance sensitivity and firms' investment opportunities

4.3.3.4 CEO ownership

Jensen and Meckling (1976) use their model to show how managerial ownership alleviate the agency conflicts by aligning managers' and shareholders' interests through equity-based incentives because they have a higher incentive to maximise shareholder value. The use of equity incentives motivates managers to pursue shareholders value maximization objectives as they become the part owner of the firm. They predict that with an increase in managerial equity ownership, managers are restraint from using corporate resources for personal gains or pursue value destroying projects.

However, prior literature documents mixed results regarding managerial shareholding link to firm performance. For example, Morck et al. (1988) shows the non-linear association for managerial shareholding and firm's Tobin's Q. The results confirm the hypothesis that when ownership decreases, managers tend to be aligned with shareholders value maximisation goals. However, managers become entrenched after their share ownership exceeds 5% where there is an increase in friction of interest.

Alternately, Jensen and Murphy (1990) and Yermack (1995) report that CEO ownership has no influence over pay-performance sensitivity. Bryan et al. (2000) show significant and negative association between CEO ownership and stock option and restricted stock grant. Florackis et al. (2009) use a semi-parametric estimation approach to study managerial ownership and performance for UK companies. Their findings support the contract alignment theory between managerial shareholding and firm performance.

H4: There is a positive relationship between the proportion of shares owned by CEOs and pay-performance sensitivity.

4.3.3.5 Corporate Governance Mechanism

The divergence between shareholding and corporate control is the source of friction between contracting parties in principal-agent relationship. Fama and Jensen (1983) propose that monitoring function creates a corporate governance mechanism which aligns managers' and shareholders' interests. Board of directors will appoint CEO and top executives and also design compensation packages while overseeing and monitoring the firm's operation, whereby an effective board of directors could lead to higher pay-performance sensitivity.

Prior literature examines the structure and effectiveness of boards of directors. Empirical studies provide mixed evidence about the board size effect on firm value. Yermack (1996) documents that Tobin’s Q decreases with the size of a board of directors of more than six directors. He finds that board fiduciary roles become more problematic when the board size increases and where the Tobin’s Q decreases by 0.23 when the board size doubles. However, Coles et al. (2008) report that Tobin’s Q has a U-shaped relationship with board size in accordance with firm

characteristics.

Several studies argue that the board structure mix (internal and external directors) influences performance. However, the dual role of a CEO as a CEO and chairman of the board of directors will hinder the effectiveness in monitoring and controlling function of the board because of agenda conflicts. Fama and Jensen (1983) suggest that internal directors have more influence than external directors. A study by Hermalin and Weisbach (1991) reports that firm performance is not linked to the fraction of external directors. They argue that because directors tend to be selected by the CEOs, they could also have their own interests which deviate from shareholders' wealth maximisation goals.

H5: There is a positive relationship between the proportion of external directors on the board and pay-performance sensitivity.

H6: There is a positive relationship between board size and pay-performance sensitivity.

4.3.3.6 Liquidity

Fazzari et al. (1988) argue that a shortage of free cash flow in a firm leads to underinvestment and they hypothesise that liquidity or internally generated funds are important determinants for investment. However, an opposite effect occurs according to Jensen (1986) in that excess free cash flow will create an overinvestment problem when managers invest in riskier projects with negative returns. Managers are assumed to reinvest available free cash flow, which in essence will maximise shareholders' wealth when the investment opportunities are high and when managers select successful projects. However, if managers do not have free cash flow, they will not overinvest because of monitoring by the external market if they raise debt to

fund their investment.

Prior empirical studies provide mixed results about the liquidity constraint hypothesis. For example, Yermack (1995) reports that stock options awards is positively and significantly related to firm's liquidity.

In contrast, Matsunaga (1995) measures liquidity as working capital in order to study the liquidity effect when firms use stock option awards to conserve cash. When controlling for leverage and liquidity to test the free cash flow effect, he finds that because the stock options exercise provides cash inflow and SARs provide the cash outflow, firms use stock options to boost short-term income strategy. However, studies show only weak evidence that firms use stock options to conserve the cash management strategy of the firm.

H7: Pay-performance sensitivity will be higher in firms with high free cash flow.

4.3.3.7 Firm Size

Demsetz and Lehn (1985) propose a negative association between equity compensation and firm size. Meanwhile, Jensen and Murphy (1990) analyse the pay-performance sensitivity on the market value of the firm as proxy for firm size. They report that sensitivity is larger for smaller firms compared to larger firms.

H8: There is a positive relationship between firm size and pay-performance sensitivity.

4.3.4 Empirical Research Model

This study employs a research model to test the determinants of pay-performance sensitivity and debt.

$$PPS = \beta_o + \beta_1 \text{Risk}_{jt} + \beta_2 \text{Size}_{jt} + \beta_3 \text{Leverage}_{jt} + \beta_4 \text{Investment}_{jt} + \beta_5 \text{FCF}_{jt} +$$

$\beta_6 Industry + \beta_7 log(BoardSize)_{jt} + \beta_8 Composition_{jt} + \beta_{1o} Ownership_{jt} + \varepsilon_{jt}$

Where

β_o = intersect

$Risk_{jt}$ = risk for j firm at time t

$Size_{jt}$ = firm size for j firm at time t

$Leverage_{jt}$ = market debt (book debt) over total assets for j firm at time t

$Investment_{jt}$ = R&D and capex for j firm at time t

FCF_{jt} = operating cash flow minus cash outflow for j firm at time t

Industry = Industry dummy

$logBoardSize_{jt}$ = log of board size for firm j at time t

$Composition_{jt}$ = Board composition for firm j at time t

$Ownership_{jt}$ = CEO ownership for firm j at time t

ε_{jt} = Error term

4.3.5 Analytical Procedure

Extreme outliers could lead to greater residuals, extend the confidence interval and could result in biased parameter estimates. In order to solve the problematic feature of panel data, it is necessary to employ the appropriate technique. Four assumptions should be met before using parametric tests; namely, normality, linearity, homoscedasticity and error term independence (Gujarati, 2003).

Statistically, it is suggested that the median is less likely to be affected by outliers or extreme values because it uses the centre value of the sample's observations. The median of all variables is less than their corresponding means for the sample, implying that the higher values lie to the left of the distribution.

Therefore, the median is assumed to be a better proxy of central tendency; therefore, median regression is chosen as the main method of regression analysis following Ortiz-Mollina (2006).

Fundamentally, the multiple regressions hold the other independent variables constant through statistical control as opposed to experimental control. In panel data regression, the availability of more data points to an increase in the degree of freedom which in turn reduces the collinearity among explanatory variables and improves the efficiency of the econometric estimates (Byungnamlee, 1996).

4.4 Data Analysis

4.4.1 Descriptive Statistics

From the descriptive statistics of the Table 4.2, the average board size is nine (mean = 9.48), whereas the largest and smallest are 23 and four directors respectively. These findings are completely consistent with Ozkan (2007). Board size in the UK appears to be smaller than board size in the US. For example, Yermack (1996) and Core et al. (1999) find that the number of directors on board in US is 12.25 and 13 directors respectively. However, a recent study by Fahlenbrach (2009) finds that the mean board size is 10 directors. In keeping with the majority of prior studies, larger board size is positively linked to higher CEO compensation.

Table 4.1: Description of variables

PPS = changes in dollar value for a 1% change in stock price	
PPS1 = $e^{-dT}N(Z)*(S.Price/100)$	N = probability function for normal distribution, d = expected dividend rate over life of option; ln(1 + expected dividend yield), T = time to maturity
PPS2 = log(Portfolio equity)*(S.Price/100)	Log Total(toptions + toptionsnew + tshares + tltip + tltipnew)
PPS3 = log(new equity)*(S.Price/100)	Log Total(tltipnew)
risk1	Standard deviation of daily stock price returns for the 12 months prior to sample year
risk2	Standard deviation of monthly stock price returns for the 36 months prior to sample year
size	Log sales
mktdebt	Long-term debt divided by the sum of market value and long-term debt
bookdebt	Long-term debt divided by total assets
invest1	Total of R&D expenses and capital expenditure divided by sales
invest2	Market to book Value
fcf	Net cash flow minus cash flow from operating activities/sales
return	Shareholder return = (End Share Price - Begin Share Price + Dividend Paid)/ Begin Share Price
logbsize	Log board size
fractionnex	Fraction of non-executive directors to board size
own1	CEO shareholding divided by common shares outstanding
salary	Salary and benefits paid
bonus	Cash bonus
toptions	Total value of options granted
toptionsnew	Total value of new option grants
tshares	Value of shares
tltip	Total value of LTIPs granted
tltipnew	Total value of new LTIP grants
totalport	Sum of salary, bonus, options, shares and LTIPs

The descriptive statistics about the proportion of non-executive directors on the boards (FRACTIONNONEX) show that, on average, 56.3% of the directors on the boards in the sample are non-executive directors, with a median of 55.5%. These findings support those of Ozkan (2007) who finds a similar average in terms of non-executive directors (i.e. 56%), and implies that UK boards are comprised of

relatively fewer non-executive directors compared to US boards. For example, Fahlenbarch (2009) finds that 73% of US boards are composed of non-executive directors. This proportion positively related to the higher level of CEO compensation.

Table 4.2: Summary statistics of predictors
The table presents the summary statistics for explanatory variables. The sample consists of 183 firms listed on the FTSE 350 from 1999 to 2008. All variables are defined in Table 4.1.

Variable	Obs	Mean	Median	Min	Max	Std. Dev.
risk1	1664	0.0209225	0.018399	0.000962	0.106586	0.010462
risk2	1595	0.0942363	0.08651	0.0237	0.44849	0.038952
size	1674	9.056647	9.031994	5.449787	11.39591	0.748444
mktdebt	1672	0.2433281	0.1947889	0	1	0.226345
bookdebt	1672	0.2001269	0.1761968	0	1.491242	0.172467
invest1	1675	0.193805	0.0530542	0.0233759	8.933333	0.552082
invest2	1641	3.90909	2.11	0.03	194.86	9.963071
fcf	1675	0.1742402	0.1086172	-1.496642	7.571058	0.505364
eps	1664	23.91835	16.825	0	166.91	23.99502
logbsize	1674	0.9778672	0.9542425	0.60206	1.361728	0.110805
fractionnex	1674	0.5631101	0.5555556	0	0.9166667	0.129
own1	1305	0.0075854	0.0003594	0	0.3299961	0.032542

Regarding the CEO-chairman duality, the descriptive statistics show that around 6% of the CEOs of the firms in the sample chair the board of directors, whilst around 94% of the firms separate these roles. These results show a significant level of firm compliance, although not a complete one, with the different reform actions which emphasise the importance of two individuals occupying these positions.

CEO share ownership amounts, on average, to about 0.75% and ranges between 0% and 33%. This implies that, on average, the percentage of share stakes held by the CEO is less than 1% in UK firms. These findings are lower than those

reported by Ozkan (2007), who finds that the mean CEO ownership for UK firms is 1.71%. For US counterparts, Core et al. (1999) report the mean of proportion of equity holdings by CEOs is 1.53%.

In Table 4.3, the mean share option pay-performance sensitivity is 0.2037. A sensitivity of 0.24 implies that an increase in shareholder wealth of 10% during the year would increase the CEO's salary and bonus by 2.4%. Based on the mean PPS for the CEO of 2.037% and a mean firm value of £2,633 million, the same 10% increase in shareholder value would increase CEO's total compensation's average by £5,363,421. This is higher than Yermack's (1995) estimation of an elasticity of $0.07 per $1000 change in shareholder wealth for US data from 1984 to 1991. Ortiz-Molina (2007) reports an elasticity of $12.7 per $1000 increase in shareholder return for US data from 1993 to 1999.

Table 4.3: Summary statistics of pay-performance sensitivity
The table presents the summary statistics for the PPS. The sample consists of 183 firms listed on the FTSE 350 from 1999 to 2008. All variables are defined in Table 4.1.

Variable	Obs	Mean	Median	Min	Max	Std. Dev.
pps1	1329	0.2036956	0.1148317	0.0014383	5.393119	0.348652
pps2	1329	14.89508	14.93307	0	20.52762	1.857964
pps3	1318	7.923339	12.10098	0	19.57145	6.547188

4.4.2 Correlation Coefficients

The correlation coefficients are tested for the existence of high collinearity among independent variables. Collinearity refers to two predictors which have almost perfect linear relationships. When the predictors have high multicollinearity, this will impose a problem because the regression model estimates of the coefficients become unstable. According to Gujarati (2003), multicollinearity could damage or

distort the results of regression analysis if the degree of correlation exceeds 80%. Therefore, the threshold of 80% is adopted as an indicator of high multicollinearity in this study.

The highest correlations, compared with other variables, are found between one-year volatility (Risk1) and three-year volatility (Risk2) with a correlation coefficient of 63.26%. This relatively high correlation is expected because the standard deviation of the 12-months' firm return (share price volatility) is part of the 36-months' share price volatility. However, the collinearity is still within the acceptable limit of below 80%. Another relatively high correlation is between market debt and book debt with a correlation coefficient of 63.29% because of the similarity of long-term debt components. From the correlation coefficient table, no high correlations are detected between the regressors. Conclusively, this model does not suffer the multicollinearity problem since all correlations are reported to be under the 80% threshold.

4.4.3 Univariate Analysis

The univariate (estimated coefficient) testing of on the mean difference between variables is significantly different from zero is presented in Table 4.5. The table shows that firm risk, leverage, free cash flow and ownership have negative and significant effects on pay-performance sensitivity. Both the mean (estimated coefficient = -2.7835) for the three-year volatility and (estimated coefficient = 0.8765) for the one-year volatility test statistics are significant at the 1% level. These results support the hypothesis that significantly greater firm risk reducing pay-performance sensitivity.

Table 4.4: Correlations between variables

Correlations between variables for a sample of 183 FTSE 350 companies from 1999 – 2008 The correlations with significance at 10% are in bold.

	pps1	pps2	pps3	risk1	risk2	size	mktdebt	bookdebt	invest1	invest2	fcf	own1	logbsize	fraction nex	return
pps1	1.0000														
pps2	**0.2686**	1.0000													
	0.0000														
pps3	0.0617	**0.2723**	1.0000												
	0.0612	**0.0000**													
risk1	**0.1083**	0.0527	-0.0340	1.0000											
	0.0002	0.0920	0.2767												
risk2	**0.1568**	0.0523	**-0.2443**	**0.6326**	1.0000										
	0.0000	0.0978	**0.0000**	**0.0000**											
size	**0.1828**	**0.1545**	**0.1727**	0.0263	**-0.1334**	1.0000									
	0.0000	**0.0000**	**0.0000**	0.2852	**0.0000**										
mktdebt	0.0608	0.0573	**0.1315**	**0.1458**	0.0121	**-0.0729**	1.0000								
	0.0405	0.0678	**0.0000**	**0.0000**	0.6298	**0.0029**									
bookdebt	0.0482	**0.0769**	**0.0997**	**-0.0519**	**-0.0619**	**-0.0803**	**0.6329**	1.0000							
	0.1042	**0.0143**	**0.0015**	**0.0352**	**0.0138**	**0.0010**	**0.0000**								
invest1	0.0031	0.0046	0.0344	**-0.0782**	**-0.0745**	**-0.3297**	**0.1133**	**0.1173**	1.0000						
	0.9178	0.8831	0.2728	**0.0015**	**0.0030**	**0.0000**	**0.0000**	**0.0000**							
invest2	0.0284	**0.1185**	0.0110	0.0322	**0.0593**	0.0073	**-0.0828**	**0.0731**	0.0345	1.0000					
	0.3434	**0.0002**	0.7281	0.2004	**0.0202**	0.7711	**0.0009**	**0.0035**	0.1692						
fcf	0.0061	0.0360	0.0158	-0.0097	-0.0370	**-0.3434**	**0.1916**	0.0127	**0.1116**	0.0234	1.0000				
	0.8375	0.2519	0.6157	0.6929	0.1414	**0.0000**	**0.0000**	0.6052	**0.0000**	0.3501					
own1	0.0145	**0.4209**	**-0.0936**	0.0082	0.0827	-0.0480	**-0.0727**	**-0.0686**	-0.0328	**0.0575**	-0.0148	1.0000			
	0.6289	**0.0000**	**0.0032**	0.7670	0.0034	0.0832	**0.0086**	**0.0132**	0.2361	**0.0403**	0.5926				
logbsize	**0.1495**	**0.0937**	**0.1657**	-0.0033	**-0.0637**	**0.2256**	**0.1846**	0.0374	-0.0431	**0.0672**	**0.0700**	0.0078	1.0000		
	0.0000	**0.0027**	**0.0000**	0.9045	**0.0219**	**0.0000**	**0.0000**	0.1720	0.1153	**0.0154**	**0.0105**	0.7808			
fractionnex	0.0039	**0.1383**	**0.2831**	0.0329	**-0.1011**	**0.1662**	0.0245	0.0221	**-0.0843**	0.0523	0.0385	0.0059	**0.0648**	1.0000	
	0.8944	**0.0000**	**0.0000**	0.2288	**0.0003**	**0.0000**	0.3721	0.4216	**0.0021**	0.0601	0.1610	0.8347	**0.0170**		
return	**0.0727**	**0.0852**	-0.0143	**-0.5900**	**-0.2648**	-0.0134	**-0.2540**	-0.0593	0.0172	0.0564	-0.0221	0.0265	-0.0017	**-0.0717**	1.0000
	0.0271	**0.0064**	0.6486	**0.0000**	**0.0000**	0.6668	**0.0000**	0.0555	0.5783	0.0721	0.4753	0.3991	0.9556	**0.0210**	

The proxies for leverage used here are market debt and book debt. The market debt test statistics (estimated coefficient = -0.0430) is significant at the 1% level but weakly significant (estimated coefficient = -0.0050) for book debt. The high and negative relationship between market debt and pay-performance sensitivity supports the hypothesis that external monitoring by bondholders reduces the shareholders' need to award CEO with large pay packages. Therefore, a firm with high leverage will award a smaller remuneration package to its CEO.

CEO ownership results show negative and significant effect on pay-performance sensitivity. The mean (estimated coefficient = -0.2651) test statistic is negatively significant at the 1% level. Similar to findings by Yermack (1995), CEO ownership indicates lower pay-performance sensitivity because of lower monitoring by shareholders when ownership is high.

The results indicate that a firm's growth opportunities have strong and positive effects on pay-performance sensitivity. The mean (estimated coefficient = 0.0259) test statistic is positively significant at the 1% level. This finding is consistent with the prediction that a firm of a larger size will award a larger remuneration package to its CEO.

Table 4.6 presents the estimates for the elasticity of portfolio equity awards. All the results for economic contracting theory provide strong and significant results. It is observed that firm risk and leverage are strongly and negatively correlated with portfolio equity. A negative relationship between leverage and equity compensation suggests that high-levered firms award less equity compensation in order alleviate the friction between principal and agent. This finding supports the hypothesis that

firm capital structure has an inverse effect on CEOs' equity awards.

With regard to elasticity of equity awards regression, the results are mixed, as shown in Table 4.7. Only firm risk provides the expected result for economic contracting theory. The mean test statistics (estimated coefficient = -62.1124) indicate that firm risk strongly and negatively affects the sensitivity of equity awards for CEOs because of managerial risk aversion.

The result shows that firm risk is negatively correlated with the pay-performance sensitivity of stock options, as shown in Table 4.5. The magnitude is greater for three-year volatility (estimated coefficient = -2.7835) compared to one-year volatility (estimated coefficient = -0.8675). Both test statistics are statistically significant at the 1% level. These results endorsed the findings by Core and Guay (1999) and Aggarwal and Samwick (1999) who report significant results. The findings support the agency model prediction whereby pay-performance sensitivities are lesser with the volatility of share price return.

Consistent with the hypothesis that there is a positive association between board of directors' size and pay-performance sensitivity, the overall result shows that there is a positive and significant relationship between board size and pay-performance sensitivity similar with the findings of Ozkan (2004). The test statistic (estimated coefficient = 0.0468) is statistically significant at the 10% level. This finding suggests that CEOs of firms with a larger board size will be awarded higher stock options tied to firm performance.

This result supports the argument that overcrowded boards are less effective in monitoring and controlling role due to inefficient of communication and coordination between board members (Ghosh, 2005) In contrast, smaller boards

seem to be more likely to perform effectively, and are less subject to managerial influence (Lipton and Lorcsh, 1992; Jensen, 1993; Ozkan, 2007). In other words, larger boards are manipulated and controlled more easily by their CEOs because the CEOs have more chances to build relationships with a greater number of non-executive directors and thus influence their control decisions for higher compensation. Therefore, the result rejects the argument that smaller boards are less capable than larger boards in terms of monitoring and controlling management actions (Baysinger and Butler, 1985; Zahra and Pearce, 1989).

These findings are consistent with Ozkan (2007) who, in a cross-sectional study using 2004 data, conclude that the larger UK boards strongly influences the equity-based compensation. Similar results are reported for US firms (Core et al., 1999; Fahlenbarch, 2009). Further, these results give some support to the findings of Yermack (1996) and Eisenberg et al. (1998) who note an adverse association between board size and firm value. This implies that executive incentives designed by the board of directors become suboptimal as the number of board members increases. However, some evidence from Asia-based studies provided by Basu (2007) and Wang et al. (2009) using Japanese and Chinese samples respectively, demonstrate non-significant results between board size and top executive cash compensation. Although these studies are related to developed countries, other factors may cause these differences in findings such as legal systems, governance structures, culture, ownership and other structural differences. In other words, firms in Asia are more often family controlled and tend to have boards comprised of family members. Therefore, a larger board size in Asian firms may not always damage the monitoring function of the boards.

Table 4.5: Median regressions: changes in dollar value of options for a 1% change in stock price.
Median regression for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of median regression for changes in dollar value of options for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return). p-values are presented in brackets.

	1	2	3	4	5	6	7	8	9	10	11	12
Intercept	**0.1732**	**0.2052**	-0.0264	**0.1248**	**0.1163**	**0.1099**	**0.1109**	**0.1168**	0.0104	**0.0945**	**0.1159**	**0.1172**
	(0.0000)	**(0.0000)**	(0.5450)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	(0.8500)	**(0.0000)**	**(0.0000)**	**(0.0000)**
risk1	**-2.7835**											
	(0.0000)											
risk2		**-0.8765**										
		(0.00)										
size			**0.0068**									
			(0.0020)									
mktdebt				**-0.0430**								
				(0.0120)								
bookdebt					-0.0050							
					(0.8340)							
invest1						**0.0259**						
						(0.0350)						
invest2							0.0010					
							(0.3020)					
fcf								**-0.0105**				
								(0.0000)				
logbsize									0.0468			
									(0.0570)			
fractionnex										0.0358		
										(0.1780)		
own1											**-0.2651**	
											(0.0000)	
return												**0.0221**
												(0.0260)
Pseudo R^2	0.0204	0.0246	0.0047	0.0025	0.0000	0.0036	0.0020	0.0014	0.0024	0.0008	0.0029	0.0063
# Obs.	1329	1323	1329	1327	1327	1316	1316	1321	1329	1329	1316	1323

Table 4.6: Median regressions: changes in the value of portfolio equity to 1% changes in share price.

Median regression for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of median regression for changes in the value of portfolio equity for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return). p-values are presented in brackets.

	1	2	3	4	5	6	7	8	9	10	11	12
Intercept	**14.7966**	**15.5910**	**10.2013**	**15.0085**	**15.1012**	**14.9086**	**14.8348**	**14.9031**	**12.5597**	**13.5103**	**14.8546**	**14.9572**
	(0.0000)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
risk1	7.1085											
	(0.3720)											
risk2		**-7.3986**										
		(0.0000)										
size			**0.2274**									
			(0.0000)									
mktdebt				-0.3078								
				(0.1290)								
bookdebt					**-0.6885**							
					(0.0310)							
invest1						0.0924						
						(0.4990)						
invest2							**0.0227**					
							(0.0230)					
fcf								0.0915				
								(0.0690)				
logbsize									**1.0603**			
									(0.0000)			
fractionnex										**2.4731**		
										(0.0000)		
own1											**19.7729**	
											(0.0000)	
return												**0.1782**
												(0.0020)
Pseudo R^2	0.0005	0.0101	0.0258	0.0009	0.0019	0.0007	0.0104	0.0016	0.0162	0.0261	0.0914	0.0068
# Obs.	1329	1323	1329	1327	1327	1316	1316	1321	1329	1329	1316	1323

Table 4.7: Median regressions: changes of value of new equity to 1% changes in stock price.

Median regression for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of median regression for changes in the value of new equity for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return). p-values are presented in brackets.

	1	2	3	4	5	6	7	8	9	10	11	12
Intercept	**12.4188**	**16.9045**	**-5.4448**	**11.4245**	**11.4200**	**11.9653**	**11.9936**	**12.0247**	**1.6360**	**2.3635**	**12.1598**	**12.1486**
	(0.0000)	**(0.0000)**	**(0.1550)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.4900)**	**(0.2130)**	**(0.0000)**	**(0.0000)**
risk1	-14.1732											
	(0.5810)											
risk2		**-62.1124**										
		(0.0000)										
size			**0.8245**									
			(0.0000)									
mktdebt				**1.7135**								
				(0.0260)								
bookdebt					**2.3194**							
					(0.0070)							
invest1						0.4259						
						(0.2090)						
invest2							**0.0137**					
							(0.8600)					
fcf								0.1688				
								(0.8630)				
logbsize									**4.4442**			
									(0.0000)			
fractionnex										**15.4314**		
										(0.0000)		
own1											**-51.4534**	
											(0.0000)	
return												0.0795
												(0.3100)
Pseudo R^2	0.0008	0.0482	0.0206	0.0046	0.0039	0.0005	0.0006	0.0003	0.0161	0.0467	0.0178	0.0007
# Obs.	1329	1323	1329	1327	1327	1316	1316	1321	1329	1329	1316	1323

The findings indicate that the proportion of non-executive directors as the proxy for board independence is positively and significantly related to equity compensation and the elasticity of new equity grants to share price. The test statistics are significant at the 1% level in both types. There is strong evidence on the relationship between pay-performance sensitivity and the proportion of non-executive directors in this study with regard to the positive role of non-executive directors in increasing the pay-performance relationship.

These results support the findings of Lambert et al. (1993), Boyd (1994), Core et al. (1999), Franks and Mayer (2001) for a sample of US firms, and Ozkan (2007) for UK firms. These studies report a positive relationship between board of directors' independence and managerial compensation. However, they contrast with the results of Conyon and He (2011) who show that firms with greater board independence has high pay-performance sensitivity.

These results show support to the monitoring and interest alignment hypothesis in agency theory. This perspective suggests that independent directors is effective in aligning the interest of the agents with shareholders' by providing firms with effective monitoring, and by using managerial compensation as a mechanism to maximise shareholders' value because such directors have no incentive to collude with management (Fama and Jensen, 1983).

This study found evidence that the proportion of shares held by CEO affects pay-performance sensitivity. The findings are in line with the hypothesis that CEO ownership is negatively related to pay-performance sensitivity; the result shows that there is a negative and significant relationship between pay-performance sensitivity and CEO ownership. The test statistic (estimated coefficient = -0.2651) is statistically

significant at the 1% significance level. The results show that higher CEO ownership will influence the pay-setting process. Therefore, the results provide strong support to the managerial power perspective that CEO ownership increases managerial power over compensation decisions in such a way as to influence compensation structure and pay-performance sensitivity.

The findings are similar with Ozkan (2007) who reports that CEO ownership has an inverse relationship with total of equity-based compensation. Core et al. (1999) find that CEO ownership has a negative relationship with CEOs' total and cash compensation in a sample of US firms. Therefore US CEO shareholding serves as incentive alignment mechanism to alleviate the agency conflicts. Also, Holderness and Sheehan (1988), Lambert et al. (1983) and Mehran (1995) find that in samples of US firms, those firms with higher managerial ownership paid the CEOs less performance-related compensation.

The coefficients presented in the Table 4.6 are used to approximate the size and direction of the association which each independent variable has with the dependent variable (i.e. changes in the value of portfolio equity). The findings for the proxy of firm risk give a mixed result. For three-year volatility (Risk 1), there is a positive but not significant result. However, for one-year volatility (Risk2), the coefficient is negative and statistically significant at the 1% level (estimated coefficient = -7.3986). This suggests that awarding CEOs with equity compensation will result in lower firm risk because CEOs are more conservative in their project selections. These findings are similar to those of Aggarwal and Samwick (1999) who report a negative association between firm risk and equity awards.

Firm size, as measured by the log of sales, is positively correlated with the

elasticity of portfolio equity. The result shows an estimate (estimated coefficient = 0.2274) which is statistically significant at the 1% level. The findings are similar with prior research (e.g. Yermack, 1995; Bryan et al. 2000) whereby larger firms has high elasticity of equity-based compensation. In absolute terms, if evaluated at the median CEO pay, which was £3,676, 388, this implies an additional exp (0.1*0.2274) -1 = .0537 increase, which is an additional equity award of £197,422.

With regard to leverage, both market leverage and book leverage are negatively correlated with the elasticity of portfolio equity. However, only book market gives a result statistically significant at the 5% level (estimated coefficient = -0.6885). It could be suggested that remunerating CEOs with equity compensation will reduce firm debt by -79.5%. This supports the finding that debt provides external monitoring to alleviate the friction in agency relationship.

Consistent with this finding, Yermack (1995) finds that firm debt has a negative impact on CEOs' equity portfolios in a sample of 3,200 US non-financial firms. In addition, his findings give similar results to the pay-performance measures, implying that debt holders provide external monitoring which reduces the conflict of interest in agency relationship. Ozkan (2007) notes that firm debt plays no role in determining CEOs' equity-based pay (i.e. the sum of LTIPs and employee stock options (ESOs)).

With regard to changes in the log of new equity to share price, the firm risk provides mixed results. Firm risk is negatively correlated with the changes in log of new equity. For Risk1, the result suggests that a firm’s three-year volatility has no significant effect on elasticity new equity awards to CEOs. The coefficient is -14.1732 and provides no support for the hypothesis that firm risk has an effect on

elasticity of equity grants to CEOs.

However, the Risk2 result is statistically significant at the 1% level. The strong and negative coefficient -62.1124 suggests that firm risk will decrease the elasticity of new equity grants to CEOs. This suggests that firm risk will reduce the elasticity of new equity grants to CEOs and supports the hypothesis that firms with high risk projects grant less new equity compared to lower risk firms.

Firm size, as measured by the log of sales, is positively correlated with changes in the value of new equity. The result shows an estimated coefficient of 0.8245 which is statistically significant at the 1% level. This is consistent with prior research (e.g. Yermack, 1995; Bryan et al. 2000) whereby larger firms award more equity-based compensation. In absolute terms, if evaluated at the median CEO pay, which was £3,676, 388, this implies an additional exp (0.1*0.8245) -1 = .209 increase, which is an additional equity award of £768,607.

With regard to leverage, market leverage and book leverage both show unexpected positive correlations with changes in the value of new equity. Both market debt and book debt give strong positive results which are statistically significant at the 1% level. It could be suggested that the number of CEOs with equity compensation elasticity will increase with firms' debt levels. The finding contradicts the notion that debt alleviates managers and shareholders conflict through external monitoring.

Consistent with the hypothesis that board size has a positive effect on CEO pay, the result shows that there is a positive and significant relationship between board size and the elasticity log of new equity grants. The estimated coefficient, 4.4442, is statistically significant at the 1% level. This finding suggests that CEOs of

firms with larger board sizes will have high elasticity of new equity grants.

The study found evidence that the proportion of shares held by CEOs affects the size of new equity. This is consistent with the hypothesis that CEO ownership is inversely related to CEO pay. The result shows that there is a negative and significant relationship between new equity grants and CEO ownership. The estimated coefficient, 51.4314, is statistically significant at the 1% level. This implies that higher CEO shareholding will influence the pay-setting process. Therefore, the results provide strong support to the managerial power perspective that CEO ownership increases managerial power over compensation decisions in such a way as to influence the compensation structure.

In summary, the univariate results show that firm risk is negatively correlated with pay-performance sensitivity. There is also evidence that the proportion of shares held by CEOs affects pay-performance sensitivity. This is consistent with the hypothesis that CEO ownership is negatively related to pay-performance sensitivity. The result shows that there is a negative and significant relationship between pay-performance sensitivity and CEO ownership.

4.4.4 Multivariate Analysis

The results of the median regressions are presented in Table 4.8, 4.9 and 4.10. The aim of this testing is to segregate the effects between the two types of debt in the leverage measurement, that is, market debt and book debt. Median regression reduces the total of absolute deviations and not the sum of squared deviations. Right skewness of the data shows that the pay-performance sensitivities lean on the smaller side of the median compared to the mean. The estimates show support for pay-performance and leverage because the negative coefficients for market debt have a

strong significance. Specifically, only market debt shows a negative association between firm leverage and managerial pay-performance (Table 4.8), which is consistent with the agency cost of debt hypothesis (John and John, 1993; Ortiz-Mollina, 2007). It could be concluded that a firm's leverage has a significant influence on pay-performance sensitivity as a mechanism in order to align the interests of CEOs and the debt holders of firms (Li, 2007)

These negative relationships could support the argument that debt holders could be a substitute for a monitoring device (Jensen, 1986; Williamson, 1988; John and John, 1993). In line with these findings, prior studies have reported similar correlations between leverage and executive compensation (Bryan et al., 2000; Ortiz-Mollina, 2007). However, Mehran (1995) finds that leverage ratio has no impact on executive compensation.

Other variables for economic contracting theory provide significant results. Firm risk is found to be negatively related to pay-performance sensitivity, which is consistent with the findings of Aggrawal and Shamwick (1999) and Ortiz-Molina (2007). However, the magnitude of the former's finding is smaller compared to observations by Ortiz-Molina (2007). Specifically, firm risk shows the hypothesised negative sign and is statistically significant at the 1% level.

There is strong support for the hypothesis that CEO pay-performance sensitivity increases with a firm's growth opportunities, a finding which is similar to those reported by Yermack (1995). It could be suggested that a firm with growth opportunities provides a higher level of CEO compensation that is linked to share price performance (Ozkan, 2012).

With regard to corporate governance measures, the results show a negative

coefficient for the fraction of non-executive directors. This is contrary to the prediction that a higher proportion of external directors will increase the monitoring mechanism and positively influence pay-performance sensitivity. The result is similar for board size but only weakly significant. This suggests that a corporate governance mechanism has little effect on pay-performance sensitivity.

The variables for firm size and a firm's growth opportunities prove to be statistically significant at the 1% level. The coefficients are positive and support the hypothesis that firms award higher equity compensation to attract managers with more talent. This is consistent with the finding of Core and Guay (1999) but contradicts the findings of Gibbon and Murphy (1992) and Ortiz-Mollina (2007).

The analysis of a firm's growth opportunities, which are the market-to-book ratio (invest1) and capital expenditure (invest2), has yielded inconclusive results. They are positive and statistically significant at the 1% level for the market-to-book ratio. However, the results for capital expenditure show no significant association between capital expenditure and CEO pay-performance sensitivity. Therefore, a firm's growth opportunities, as reflected by the market-to-book ratio, play a positive role in determining CEO pay-performance sensitivity and reflect the firms' demand for higher quality CEOs. Some of the prior studies with mixed results include Ozkan (2007), Conyon (2009) and Cadman (2010). However, there are other empirical studies which find a positive relationship such as Core et al. (1997) and Bryan et al. (2000).

Table 4.8: Median regressions: changes in dollar value of options for a 1% change in stock price.
This table presents the multivariate regressions for changes in dollar value of options for a 1% change in stock price. The table reports coefficients of median regression for changes in dollar value of options for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return) . p-values are presented in brackets.

	Market debt				Book debt			
	13	14	15	16	17	18	19	20
	Risk1		Risk 2		Risk1		Risk 2	
Intercept	-0.1829	**-0.2185**	-0.2478	-0.1751	-0.2052	**-0.2571**	-0.2144	**-0.1930**
	(0.2330)	**(0.0310)**	(0.0710)	(0.1120)	(0.1390)	**(0.0630)**	(0.0650)	**(0.1320)**
risk1	-1.2590	**-1.8040**			**-1.6471**	**-2.1124**		
	(0.101)	**(0.0170)**			**(0.0460)**	**(0.0000)**		
risk2			**-0.5504**	**-0.6611**			**-0.5991**	**-0.6709**
			(0.0100)	**(0.0000)**			**(0.0000)**	**(0.0000)**
size	**0.0146**	**0.0138**	**0.0138**	**0.0108**	**0.0156**	**0.0157**	**0.0113**	**0.0106**
	(0.0010)	**(0.0100)**	**(0.0130)**	**(0.0250)**	**(0.0050)**	**(0.0140)**	**(0.0420)**	**(0.0420)**
mktdebt	-0.0331	-0.0002	**-0.0424**	-0.0098				
	(0.3540)	(0.9930)	**(0.0500)**	(0.8000)				
bookdebt					0.0049	0.0273	0.0011	0.0286
					(0.8720)	(0.3490)	(0.9750)	(0.5190)
invest1	**0.0406**		**0.0400**		**0.0383**		**0.0262**	
	(0.0120)		**(0.0050)**		**(0.0010)**		**(0.0520)**	
invest2		0.0020		0.0013		0.0020		**0.0013**
		(0.1550)		(0.1320)		(0.0920)		**(0.0650)**
fcf	**0.0666**	**0.0645**	**0.0605**	**0.0682**	**0.0704**	**0.0652**	**0.0594**	**0.0615**
	(0.0310)	**(0.0010)**	**(0.0250)**	**(0.0010)**	**(0.0010)**	**(0.0000)**	**(0.0330)**	**(0.0690)**
logbsize	-0.0049	-0.0019	0.0053	0.0091	-0.0041	0.0009	0.0144	0.0179
	(0.8650)	(0.9280)	(0.7100)	(0.6160)	(0.8110)	(0.9710)	(0.5250)	(0.3450)
fractionnex	-0.0421	-0.0661	-0.0332	-0.0480	**-0.0589**	-0.0739	-0.0434	**-0.0544**
	(0.306)	(0.0520)	(0.3030)	(0.2200)	**(0.2690)**	(0.0690)	(0.2920)	**(0.1770)**
own1	**-0.1884**	**-0.2277**	-0.1090	-0.1113	**-0.1678**	**-0.2415**	-0.0882	**-0.1036**
	(0.0510)	**(0.0060)**	(0.1020)	(0.1940)	**(0.0520)**	**(0.0100)**	(0.5640)	**(0.1390)**
return	-0.0012	-0.0017	0.0018	0.0010	-0.0008	-0.0024	0.0031	0.0011
	(0.8790)	(0.8060)	(0.8000)	(0.8780)	(0.8790)	(0.6660)	(0.7110)	(0.8790)
Adjusted R^2	0.0790	0.0753	0.0865	0.0804	0.0780	0.0757	0.0852	0.0807
# Obs.	1307	1309	1311	1314	1307	1309	1311	1314

Table 4.9: Median regressions: changes in value of portfolio equity for a 1% change in stock price.
This table presents the multivariate regressions for changes in value of portfolio equity for a 1% change in stock price. The table reports coefficients of median regression for changes in the value of portfolio equity for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return). p-values are presented in brackets.

	Market debt				Book debt			
	13	14	15	16	17	18	19	20
	Risk1		Risk 2		Risk1		Risk 2	
Intercept	**3.8924**	**3.9805**	**3.2282**	**3.3711**	**3.2670**	**3.6767**	**3.1640**	**3.1542**
	(0.0000)	**(0.0030)**	**(0.0120)**	**(0.0030)**	**(0.0000)**	**(0.0000)**	**(0.0020)**	**(0.0010)**
risk1	**21.6744**	15.6604			**23.0904**	**20.5514**		
	(0.0140)	(0.0630)			**(0.0290)**	**(0.0460)**		
risk2			1.5631	2.1006			1.1120	2.1314
			(0.5290)	(0.3050)			(0.6140)	(0.2660)
size	**0.4116**	**0.4008**	**0.4488**	**0.4366**	**0.4451**	**0.4211**	**0.4577**	**0.4502**
	(0.0000)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
mktdebt	**-0.4162**	-0.2249	-0.2686	0.0176				
	(0.0450)	(0.4750)	(0.4740)	(0.9620)				
bookdebt					**0.8241**	**0.8715**	**0.9429**	**0.7984**
					(0.0140)	**(0.0090)**	**(0.0030)**	**(0.0080)**
invest1	**0.3314**		**0.3287**		0.2033		0.2171	
	(0.0190)		**(0.0130)**		(0.1660)		(0.0830)	
invest2		**0.0405**		**0.0456**		**0.0401**		**0.0455**
		(0.0020)		**(0.0060)**		**(0.0000)**		**(0.0000)**
fcf	**0.4715**	**0.6200**	**0.6103**	**0.5909**	**0.6976**	**0.7055**	**0.6596**	**0.6276**
	(0.024)	**(0.0010)**	**(0.0010)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
logbsize	0.1124	0.1752	0.0458	0.0543	0.0465	0.0267	-0.0672	-0.0651
	(0.6090)	(0.4290)	(0.8660)	(0.7990)	(0.8330)	(0.8910)	(0.8140)	(0.7970)
fractionnex	**0.6413**	0.3810	0.4598	0.3219	0.2648	0.1286	0.3861	0.1448
	(0.1580)	(0.3740)	(0.3010)	(0.4510)	(0.6170)	(0.7780)	(0.2760)	(0.7060)
own1	**20.4875**	**18.9800**	**20.0311**	**18.8472**	**21.4451**	**20.1821**	**21.3132**	**19.8428**
	(0.0000)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
return	**0.2855**	**0.2681**	**0.2409**	**0.2382**	**0.3040**	**0.2869**	**0.2387**	**0.2409**
	(0.0000)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0010)**	**(0.0000)**	**(0.0000)**
Pseudo R^2	0.2601	0.2731	0.2629	0.2707	0.2616	0.2762	0.2664	0.2754
# Obs.	1307	1309	1311	1314	1307	1309	1311	1314

As expected, firm size, as measured by the log of sales, is positively correlated with pay-performance sensitivity. The result shows the estimated coefficients, which are statistically significant at the 1% level. This is consistent with prior research (e.g. Yermack, 1995; Bryan et al. 2000) findings that larger firms have higher pay-performance elasticity. This reflects the operational complexity of larger firms which require high quality CEOs to deliver results as justified by the correlations. This concurs with findings by Mehran (1995), Core et al. (1999), Conyon et al. (2009) and Cadman (2010).

The results of stock volatility (three-year and one-year), as the proxies for firm risk, demonstrate that firm risk is negatively and significantly related to pay-performance sensitivity with coefficients statistically significant at the 1% level. The findings reject the hypothesis that the riskiness of a business is an increasing function of pay-performance sensitivity for risk-averse managers. Prior studies which control for the impact of firm risk on pay-performance sensitivity and which find a similar non-significant or negative association are Mehran (1995), Core et al. (1999) and Conyon et al. (2009). However, there are studies which find positive coefficients; for example, Aggarwal and Mandelker (1999) and Cyert et al. (2002).

Free cash flow shows a positive correlation with pay-performance sensitivity because most of the results are statistically significant at the 1% level. The findings are consistent while also controlling for market debt and book debt. They demonstrate that firms' free cash flow is positively and significantly associated with pay-performance sensitivity and support the hypothesis that firms with higher free cash flow demand greater pay-performance from CEOs. The findings are similar to those of Yermack (1995) and Bryan et al. (2000).

The analysis of the measurement of firm debt, that is, market debt and book debt, has shown inconclusive results. There is no significant association between market debt and pay-performance sensitivity because the results are only weakly negative. However, the results are weakly positive for book debt. Consequently, a firm's debt is found to play no role in determining pay-performance sensitivity, except for market debt which is as expected. The coefficients are negative and one (-0.0424) is statistically significant at the 5% level (Table 4.8). An interpretation could be that a firm's debt does not influence the pay-performance demand with regard to CEOs. The results reject the hypothesis that debt acts as a monitoring mechanism and deters CEOs from misaligning their interests with shareholders. Prior studies that document negative associations are Bryan et al. (2000), Cyert et al. (2002) and Ortiz-Mollina (2006). However, there are other studies which report insignificant relationship between firm debt and pay-performance sensitivity such as Mehran (1995) and Yermack (1995).

The study found evidence that the proportion of shares held by CEOs affects pay-performance sensitivity. This is consistent with the hypothesis that CEO ownership is negatively related to pay-performance sensitivity. The result shows that there is a negative and significant relationship between pay-performance sensitivity and CEO ownership. The estimated overall coefficients are negative and statistically significant at the 1% level. This shows that higher CEO shareholding will influence the pay-setting process. Therefore, the results provide strong support to the managerial power perspective that CEO ownership increases managerial power over compensation decisions in such a way as to influence the compensation structure and pay-performance sensitivity.

Table 4.10: Median regressions: changes in value of new equity for a 1% change in stock price.
This table presents the multivariate regressions for changes in value of new equity for a 1% change in stock price. The table reports coefficients of median regression for changes in the value of new equity for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return). p-values are presented in brackets.

	Market debt				Book debt			
	13	14	15	16	17	18	19	20
	Risk1		Risk 2		Risk1		Risk 2	
Intercept	**-9.0377**	**-7.1965**	**-7.9178**	**-5.9322**	**-9.2473**	**-7.9394**	**-8.5917**	-5.9219
	(0.0020)	**(0.0038)**	**(0.0000)**	**(0.0050)**	**(0.0000)**	**(0.0020)**	**(0.0050)**	(0.1690)
risk1	-9.4689	-6.0155			-7.4028	-4.3753		
	(0.2710)	(0.6220)			(0.6510)	(0.8280)		
risk2			-9.5307	**-10.4741**			**-7.3344**	-7.6638
			(0.0240)	**(0.0270)**			**(0.0340)**	(0.1870)
size	**0.3238**	**0.2609**	**0.3221**	**0.2376**	**0.3331**	**0.2851**	**0.3476**	**0.2762**
	(0.0040)	**(0.0020)**	**(0.0050)**	**(0.0030)**	**(0.0000)**	**(0.0040)**	**(0.0000)**	**(0.0080)**
mktdebt	1.1747	0.9065	1.4938	**1.4799**				
	(0.1950)	(0.2910)	(0.0920)	**(0.0050)**				
bookdebt					**1.1917**	1.0362	**1.2522**	1.3568
					(0.0220)	(0.1380)	**(0.0140)**	(0.0730)
invest1	0.5066		**0.5260**		**0.4663**		0.4531	
	(0.1550)		**(0.0340)**		**(0.0090)**		(0.2140)	
invest2		0.0076		0.0140		0.0102		0.0026
		(0.8530)		(0.5420)		(0.5390)		(0.9400)
fcf	0.4907	0.5764	0.6065	0.5698	0.5644	0.5451	0.5515	0.4913
	(0.4500)	(0.2280)	(0.2730)	(0.5300)	(0.1600)	(0.6230)	(0.4890)	(0.4400)
logbsize	0.6775	0.5531	0.4551	0.4623	0.6251	0.6235	0.4154	0.3567
	(0.1830)	(0.3280)	(0.6180)	(0.0810)	(0.2720)	(0.3380)	(0.2140)	(0.6560)
fractionnex	1.9650	1.2628	1.9681	1.4792	1.8258	1.3800	**1.9732**	1.4917
	(0.1790)	(0.2640)	(0.2440)	(0.1210)	(0.0890)	(0.1350)	**(0.0170)**	(0.1490)
own1	-3.5045	-2.2837	-1.6418	-2.2374	-2.7399	-1.9465	-1.8320	-1.6859
	(0.7960)	(0.8890)	(0.9060)	(0.8330)	(0.8430)	(0.9050)	(0.8890)	(0.9200)
return	0.2308	**0.2032**	0.1816	**0.1797**	**0.1704**	0.1709	**0.1459**	**0.1409**
	(0.0570)	**(0.0140)**	(0.1020)	**(0.0080)**	**(0.0060)**	(0.0790)	**(0.0000)**	**(0.0230)**
Pseudo R^2	0.2727	0.2700	0.2714	0.2712	0.2727	0.2701	0.2709	0.2707
# Obs.	1307	1309	1311	1314	1307	1309	1311	1314

Table 4.11: OLS regressions: changes in dollar value of options for a 1% change in stock price.

This table presents the multivariate regressions for changes in dollar value of options for a 1% change in stock price. The table reports coefficients of OLS regression for changes in dollar value of options for a 1% changes in stock price. Explanatory variables are risk1 (36 months share price volatility), risk2 (12 months share price volatility, size (firm size), mktdebt (market value of debt), bookdebt (book value of debt), invest1 (R&D plus capital budgeting), invest2 (market to book ratio), fcf (free cash flows), logbsize (natural logarithm of board size), fractionnex (proportion of non-executive directors on board), own1 (CEO share ownership) and return (firm's return). p-values are presented in brackets.

	Market debt				Book debt			
	13	14	15	16	17	18	19	20
	Risk1		Risk 2		Risk1		Risk 2	
Intercept	**-1.3283**	**-1.3518**	**-1.3261**	**-1.2488**	**-1.3544**	**-1.4003**	**-1.3489**	**-1.3011**
	(0.0000)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
risk1	**-4.1022**	**-5.1030**			**-4.3183**	**-5.2671**		
	(0.0290)	**(0.0080)**			**(0.0210)**	**(0.0060)**		
risk2			**-1.2629**	**-1.3392**			**-1.3163**	**-1.3836**
			(0.0060)	**(0.0040)**			**(0.0040)**	**(0.0030)**
size	**0.0621**	**0.0606**	**0.0545**	**0.0525**	**0.0629**	**0.0624**	**0.0552**	**0.0541**
	(0.0000)	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
mktdebt	-0.0282	0.0014	-0.0239	-0.0087				
	(0.6990)	(0.9840)	(0.7470)	(0.9060)				
bookdebt					0.0479	0.0718	0.0533	0.0706
					(0.5590)	(0.3830)	(0.5220)	(0.3960)
invest1	**0.0543**		0.0442		0.0501		0.0397	
	(0.0880)		(0.1730)		(0.1140)		(0.2190)	
invest2		0.0024		0.0002		0.0024		0.0002
		(0.2590)		(0.9280)		(0.2480)		(0.9190)
fcf	**0.0700**	**0.0697**	**0.0655**	**0.0665**	**0.0724**	**0.0713**	**0.0678**	**0.0687**
	(0.0680)	**(0.0710)**	**(0.0900)**	**(0.0860)**	**(0.0580)**	**(0.0630)**	**(0.0780)**	**(0.0750)**
logbsize	**0.1396**	**0.1376**	**0.1677**	**0.1658**	**0.1361**	**0.1352**	**0.1643**	**0.1627**
	(0.0170)	**(0.0210)**	**(0.0050)**	**(0.0060)**	**(0.0200)**	**(0.0230)**	**(0.0060)**	**(0.0070)**
fractionnex	**-0.3386**	**-0.3682**	**-0.3294**	**-0.3479**	**-0.3353**	**-0.3626**	**-0.3259**	**-0.3417**
	(0.0020)	**(0.0010)**	**(0.0030)**	**(0.0020)**	**(0.0020)**	**(0.0010)**	**(0.0040)**	**(0.0020)**
own1	-0.1347	-0.1638	-0.0297	-0.0384	-0.0780	-0.1157	0.0291	0.0211
	(0.7160)	(0.6640)	(0.9370)	(0.9210)	(0.8320)	(0.7580)	(0.9380)	(0.9560)
return	-0.0011	-0.0066	0.0067	0.0061	-0.0004	-0.0068	0.0078	0.0067
	(0.9500)	(0.7140)	(0.6750)	(0.7040)	(0.9820)	(0.7010)	(0.6190)	(0.6730)
Adjusted R^2	0.1218	0.1169	0.1278	0.1208	0.1220	0.1177	0.1281	0.1215
# Obs.	1307	1309	1311	1314	1307	1309	1311	1314

4.5 Conclusion

The present paper develops empirical evidence to investigate the effect of capital structure on pay-performance sensitivity. First, the evidence shows that a firm's debt has no significant effect on pay-performance sensitivity. This can be concluded that a firm's leverage has little influence on pay-performance sensitivity as a means to induce interest alignment between principal and agents.

However, the results indicate that higher ownership will influence the pay-setting process. Therefore, the results provide strong support to the managerial power perspective that CEO ownership increases managerial power over compensation decisions in such a way as to influence the compensation structure and pay-performance sensitivity, a finding which offsets the effectiveness of debt holders as a monitoring mechanism in firms.

Although the findings of this research based on UK data provide mixed results, some attributes exist which are not covered in this paper. One area which shows a promising link to pay-performance sensitivity is corporate governance variables using a number of directors' meetings and CEO age/tenure. This provides some interesting areas to examine in future research.

Chapter 5: Executive Compensation and Payout Policy: Evidence of UK Panel Data

5.1 Introduction

Because of the separation of ownership and control, shareholders are often concerned with management activities and corporate policies. According to Easterbrook (1984) and Jensen (1986), conflict often arises on the topic of excess cash flow as management tend to arbitrarily reinvest these funds (Jensen and Meckling, 1976; Jensen, 1986; Bates, 2005). Thus, from the perspective of shareholders, a corporate pay-out policy prevents company management from reinvesting an excessive amount of free cash flow.

A defined pay-out policy ensures that management cannot arbitrarily invest excess cash and the distribution of excess cash amongst shareholders in the form of dividends restricts the amount of cash available to management (Jensen, 1986). Thus, management are encouraged to invest excess cash flow into promising NPV projects in an attempt to generate shareholder profit and ease relations between management and the board. In effect, dividend allocation effectively circumvents the risk of overinvestment and underinvestment on the behalf of management (Easterbrook, 1984; Jensen, 1986; Fluck, 1999; Myers, 2000).

Several authors have addressed factors which impact upon decisions in relation to pay-out with earlier studies suggesting that the pay-out policy was largely dependent on the relationship between management and shareholders. If both parties have a

relatively amicable relationship, there is no need for frequent pay-outs as management are unlikely to reinvest an excessive amount of excess cash flow. This hypothesis has been substantiated by further studies as a negative correlation has been identified between dividend pay-outs and managerial shareholding (Rozeff, 1982; Eckbo and Verma, 1992).

It has also been hypothesised that if a higher level of excess cash flow is accrued, the frequency of pay-outs will decrease as the proportion of managerial share ownership increases. Nonetheless, a significant correlation between managerial ownership and share repurchases has not yet been identified. For instance, Bates (2005) posits that pay-out levels rise in line with managerial shareholding levels whereas Fenn and Liang (2001) argue that no conclusive correlation can be identified. However, Fenn and Liang (2001) acknowledge that pay-outs do indeed increase in line with managerial shareholding levels in companies with excessive free cash flow and low investment opportunities.

The significance of managerial incentive towards financial policy raises the questions of how and to what extent pay influences payouts. This chapter examines whether cash and equity based compensation as incentive alignment mechanism would increase the level of total payouts. A re-examination of the factors which influence corporate payout policy is important for several reasons. First, the reasons for dividends and repurchasing shares could have changed significantly since the early 1990s. Second, emerging evidence shows that firms with weak governance mechanisms have tendencies to invest in value destroying projects (Dittmar and Mahrt-Smith, 2007; Oswald, 2008). This research aims to complement the empirical works of Fenn and Liang (2001) and Hu and Kumar (2004) for UK firms for dividend and share

repurchases payouts.

The choice of payouts has also been debated in financial economic literature. Grullon and Michealy (2002) show the growth of repurchase programmes in addition to dividend payouts, suggesting that these two forms of cash distribution to shareholders are not mutually exclusive. Prior studies identify the reasons of a firm's choice for share repurchases. A firm may engage in share repurchases as a substitute for dividends payouts (e.g. Dittmar, 2000; Jaganathan et al., 2000; Grullon and Michealy, 2002). Other studies argue that share repurchases enables the firm to provide a signal of 'true' share price if the firm's share price is selling below value in the stock market (Vermaelen, 1981; Ikenberry et al., 1995). Several empirical works provide evidence that managers disburse free cash flow in the form of share repurchases to shareholders(Stephens and Weisbach, 1998; Dittmar, 2000; Mitchell and Dharmawan, 2007).

As stated above, this study aims to examine whether shareholders should be concerned with excess cash flows in firms. The objective is also to determine whether the CEO compensation structure and improved corporate governance have effects on payout policy. The results show that CEO shareholdings, LTIPs and equity portfolios have positive effects on dividend payouts, thus supporting the hypothesis that CEO ownership and compensation packages are able to align managers' and shareholders' interests to mitigate the free cash flow problem. However, corporate governance variables show inconclusive results on the link between CEO compensation and payout policy.

The results contribute to the literature on executive compensation and the literature on free cash flow. They confirm that high cash holdings increase the level of

total payouts of firms to benefit the shareholders. However, in contrast to Fenn and Liang (2001), debt does not decrease the level of payouts because CEOs still increase the payout level when the cash holdings and CEO shareholdings are high.

Because excess cash holdings increase the likelihood of agency conflicts of free cash flows between managers and shareholders, potentially effective corporate governance mechanisms such as management compensation and debt are used to curb managerial wealth expropriation tendencies. Prior studies show that managerial ownership increases the propensity to disburse cash payouts to shareholders (Fenn and Liang, 2001; Hu and Kumar, 2004).

The following section will discuss the literature review and is followed by a section on research methodology and hypotheses development. The next Section 5.3 discusses the sample construction, variable definitions and summary statistics of the data. This is followed by the presentation of the results on the relations between various measures of managerial incentives, corporate governance, debt and payouts. The final section concludes the chapter.

5.2 Literature Review: Determinants of Payout Policy.

5.2.1 Stock Options

The overinvestment problem can be reduced through payout programmes (Jensen, 1986).Chang (1993) argues that managers' tendencies to retain funds and overinvest can be curbed by giving them discretion to pay out excess funds and linking their compensation to the payouts. The benefit of adopting a residual payout policy either through dividend payouts or share repurchases is to reduce the unnecessary

investment in risky projects when all high return investments are financed. The model illustrates a discretionary payout contract between managers and shareholders in the context of a bankruptcy threat. Because the possibility of compensation increases with discretionary payout, the compensation scheme can be structured to provide managers with incentives to make appropriate payouts. Because deferred compensation schemes are tied to the stock or performance goals in order to provide incentive benefits to managers, LTIPs could influence corporate payout policy because they help to alleviate the overinvestment problem (Scholes, 1991).

In order to mitigate agency costs, executive compensation could help to alleviate the principal-agent problem. Specifically, equity-based compensation (stock options and shares) can be used as incentive alignment mechanism in agency relationship. Fluck (1999) illustrates a model which involves the firm's payout decision when managers have takeover threat. Entrenched managers are forced to abandon their self-serving interests and commit to higher payouts for shareholders. Therefore, payout policy helps to alleviate the friction between principal and agent. The author's model predicts a negative association between managerial shareholding and dividend payouts (Dutta et. al., 2011). This is due to a high alignment of interest from managerial share ownership, which lessens the incentives to expropriate corporate resources.

However, the impact is lessened according to the type of incentives. Lambert et al. (1989) investigate the impact of executive stock options on corporate payout policy. They argue that managers are reluctant to disburse cash dividends when they have stock options outstanding as the value of their stock options holding will be negatively impacted by future dividend payments. This makes dividend payouts less attractive in order to disburse excess cash flow to shareholders compared to share repurchases

(Akhigbe and Whyte, 2012).

Many studies posit that payout choices between dividend and share repurchases are influenced by stock options (Dittmar, 2000; Grullon and Michealy, 2004; Brav et al., 2005; Akhigbe and Whyte, 2012). For example, Lambert et al. (1989) show the method of share repurchases payouts increase following the use of stock options plans as a part of compensation to managers. In recent research based on a sample of financial firms, Akhigbe and Whyte (2012) provide evidence that cash compensation such as salary has positive influence over dividend payouts but report a negative association to share repurchases. Following the study by Fenn and Liang (2001), they examine the link between managerial shareholding and dividend payout. Their results show negative relationship between executive ownership and payout policy. . They conclude that such a relationship is expected when higher regulation for financial institution in conjunction with managerial shareholding are used to minimise conflicts of interest between managers and shareholders.

Study by Lambert et. al. (1989) test the hypothesis of the inverse relationship between stock options and dividend payouts on a random sample of 221 US merchandising firms for 1956. The results show support for the hypothesis when they find a negative and significant decrease in dividend payouts following executive stock option grants.

This is further corroborated when Smith and Watts (1992) examine the impact of dividend payouts and financing decisions on executive stock options. They define dividend policy as dividend yield or dividend-to-price ratio. According to the optimal contracting hypothesis, they argue that when the firms have abundance prospective projects, firms will pay lower dividends as cash is used to fund the ventures. They

predict that the ratio of assets in place is positively related to dividend policy using the dividend yield as proxy. However, as managers with stock options outstanding did not prefer dividends payout, they test whether stock options and dividend yield are inversely associated., They find strong support for the inverse relationship expected from stock options and dividend yield. However, the results for their total compensation and dividend yield are statistically insignificant.

Similar results are reported when Fenn and Liang (2001) provide evidence of negative and significant association between between dividends payouts and managerial stock options. Using a sample of 1,100 non-financial firms for 1993-1997, they empirically test the hypothesis that firms with management stock options influence corporate payout policies by reducing dividends. They argue that firms which have executive stock options outstanding prefer to disburse excess cash to shareholders via share repurchases programme than as dividend payouts (Bens et. al, 2003)

The preference between dividends or share repurchase payouts is further explored in other studies. Dittmar (2000) argues that a share repurchase exercise is preferable when managers have high stock options outstanding. Using the management incentive hypothesis, she investigates the relationship between share repurchases and compensation policy. She contends that share repurchase will alter a firm's leverage ratio after the exercise. Further, share repurchase allows for cash disbursement to shareholders without diluting the existing per-share value. By maintaining the original share price, managers with stock option grants will opt for share repurchase over dividend payouts since repurchase does not dilute the per-share value. Using a sample of US firms from 1977 to 1996, Dittmar (2000) tests the hypothesis that firms with large stock options outstanding have preference for repurchase shares as payouts. The results

show no evidence that firms elect for share repurchases when holding higher stock options.

Outstanding share options also influence payout policy because managers view their compensation portfolio differently. For instance, Bens et al. (2003) find opposite results for their study of 357 US industrial firms from 1996 to 1999. They find that managers with larger unexercisable share options tend to shift payout policy towards share repurchases. They conclude that management prefer repurchasing shares than making dividend payments when they have high stock options outstanding because of less dilution of per-share value.

Kahle (2002) explains that options funding repurchases has a positive signalling effect on the analysis of equity returns. Share repurchases invariably constitute new favourable information about the financial health of the firm. The popularity of share repurchases is based on the notion that managers fund the exercise of employee stock options through a buy-back programme. The author finds that managers tend to engage in share repurchases when there are large executive stock options outstanding and within stock options exercise period. Therefore, this hypothesis predicts a positive association between stock options and share repurchases programme.

However, there is a way to reduce the dilutive effect of dividends on stock options. Gao (2010) finds that managerial hedging lessens the negative relationship between management stock options and corporate dividends. The hedging cost is measured by the availability of stock options on the stock options exchange and whether managers trade their listed stock options. When managers can hedge their portfolios through the public options exchange, they are less influenced by the incentive of compensation via stock options. Therefore, managers with stock options are not induced

to cut the dividend payout and undermine the inverse association that dividend payout will dilute the per-share value. Managers hedge their incentive portfolios to increase their ability to bear risk by implementing over-the-counter transactions to trade their portfolios.

The trend of cash payouts has been linked with the type of compensation packages. In a study by Kahle (2002) regarding open market repurchases for 1992-1996 in the US, she reports that there is positive association between compensation packages and preference of cash payout exercise, , especially with the trend of stock option grants during the mid-1980s to the 1990s. However, the impact of LTIPs on payout policy has not been explored a great deal, especially as UK firms have a high proportion of LTIP grants following the recommendation of the Greenbury Report (1995) that firms replace stock options with LTIPs in executive compensation schemes.[2] This provides interesting grounds for this study to explore the effect of LTIPs on payouts.

5.2.2 Excess Cash Flow

Can excess cash flow divert CEOs' operating performance? According to Jensen and Meckling (1976), managers tend to invest excess cash flow in value decreasing businesses, a move which deviates from shareholders' value-maximising goals. Furthermore, the disbursement of excess cash flow to shareholders through dividend payouts may limit the overinvestment problem because of restrictions on available resources (Jensen, 1986) Managers are forced to invest in positive NPV projects which

[2] The Greenbury Report is a set of regulations on directors' remuneration chaired by Sir Richard Greenbury and published in July 1995. The main purpose of the report is to propose a new code of best practice which emphasises accountability and full disclosure reporting in annual reports (para. B4), and shows that managerial remuneration is linked to firm performance in order to prevent excessive salaries, bonus payments and non-performance linked incentives among UK firms.

increase shareholders' wealth and alleviate the friction between parties in agency relationship. In order to mitigate the overinvestment problem, corporate dividend payout policy provides a mechanism to deter managers' unproductive corporate expenditure.

Other studies also conclude that one way to mitigate the agency cost of free cash flow is using the share repurchases as cash disbursement to shareholders (Bagwell and Shoven, 1988; Mitchell and Dharmawan, 2007). When investment opportunities are scarce for firms with excess cash flow, managers tend to expropriate company funds for private benefits, invest in inefficient projects or entrench themselves in the pursuit of empire building. Therefore, share buy-back provides a mechanism to curb the free cash flow problem where there is a greater possibility of share repurchase because of surplus cash and low investment opportunities for firms (Mitchell and Dharmawan, 2007).

This shows that a lack of investment opportunities and high cash reserves propagates forms of cash payouts other than dividends. As posited by Dittmar (2000), the rising trend in share repurchases is motivated by the need to return cash to shareholders by limiting the coffer of cash resources to the firms' managers. Grullon and Michealy (2004) report that cash disbursement via share repurchases is employed to limit the managerial tendencies to over invest in low return projects when lacking better investment opportunities. There could be a preference for share repurchase over dividend payout due to payout flexibility because dividends are sticky and more set over the years (Brav et al., 2005).

Jaganathan et al. (2000) investigate the impact of cash flow's volatility on payout policy. They argue that managers choose to pay out dividends when firms have stable cash flows. Therefore, operating cash flow will be positively associated with

dividend payouts. They hypothesise that managers choose share repurchase when there is uncertainty about future cash flows. By examining a random sample of dividend payouts and repurchase announcements from 1985 to 1996, they find that firms pay dividends from sustainable cash flows and make share repurchases for short-term excess cash flow.

Building on this research, Oswald and Young (2008) further test the flexibility of cash flows and the impacts on firms' payout policies. Based on an analysis of 381 UK non-financial firms for 1995-2003, they find similar results where firms with volatile cash flows prefer share repurchase to dividend payout. However, they note that when the investment opportunities are low, managerial share ownership and external monitoring by shareholders will influence the distribution of excess cash to shareholders.

Denis and Osobov (2008) conclude that firm size influence the dividend payout desicion as big firms has high likelihood of making dividend payment compared to small firms. However, dividend paying firms will discontinue payouts when firms hit financial trouble because of negative retained earnings. The other finding is that UK and Canadian firms have a low likelihood of paying dividends and show a systematic decline in payouts from 1993 to 2002. According to Fama and French (2001), share repurchase is not a substitute for dividend payout but acts to supplement the high earnings payouts of cash dividends.

Their analysis is supported when Lee and Suh (2011) report firms issue dividend payouts together with share repurchases programme as part of cash disbursement plan to shareholders. They find that repurchasing firms have different characteristics which influence their propensity to pay dividends. With this evidence, the authors contend

that non-dividend paying repurchasing firms are smaller firm with low profitability, thereby making share repurchase more feasible compared to dividends because such firms are not tied to a long-term cash flow commitment.

Various studies have shown how the deployment of excess cash flows has become the source of agency conflicts between managers and shareholders. The view of the majority of scholars is that during a major economic growth cycle, a high increase in cash holding is the source of a misalignment of interests. Managers could act to increase cash disbursement to shareholders or engage in other business expansion pursuits. They could also spend cash flows internally, use cash for corporate acquisitions or continue to hold cash reserves. Because the strategic decision to utilise the surplus cash depends on managerial self-interest, agency problems regarding the propensity to expropriate wealth and how payouts discipline managers to focus on wealth maximisation projects are central to the objective of this study.

5.2.3 Debt

Capital structure is influential in a firm's payout policy which also act to smooth the friction between principal and agent. Ortiz-Molina (2007) shows that debt will induce lenders to monitor firms, reducing excess cash available to managers and encourage shareholders' firm value maximization. Jensen (1986) discusses the agency cost of free cash flow, where debt acts as an alternative method to managers' misappropriation of corporate sources flow by avoiding investment in risky projects. Firms which choose debt to disgorge excess cash flows are expected to have lower dividend payouts and share repurchases. Fenn and Liang (2001) find support for this hypothesis and report strong negative results between dividends and repurchase

payouts, and also the proxy for debt ratio.

Zwiebel (1996) highlights the role of debt to overcome agency problems when managers are entrenched with firm shareholders. He presents a model in which consistent debt contracts and dividend policies limit managers' tendencies to disgorge excess cash flows through investment in inefficient projects. When there is a lower threat of management dismissal because of their entrenchment, managers are forced to economically manage the corporate resources by setting cash dividend payouts and determining the leverage limit of their choice.

In addition to dividend payouts, share repurchases is a method of managerial preference for payouts as the increase capital structure ratio is not affected by the share price dilution (Dittmar, 2000; Hovakimian et al., 2001; Hovakimian, 2004; Mitchell and Dharmawan, 2007. Moreover, firm characteristics such as firm size influence the payout choices via share repurchases as small firms prefer to engage in repurchases. This is due to the adjustment costs of capital to change the debt-equity ratio is not feasible for smaller firms (Mitchell and Dharmawan, 2007). Therefore, excess debt capacity will likely result in on-market share repurchase. The empirical studies find a significant and negative association between share repurchases and debt ratio. (Bradley et al., 1984; Mitchell and Dharmawan, 2007).

Different types of share repurchase programmes are also used by managers when they want to alter a firm’s capital structure (Baker et al., 2003). The authors suggest that self-tender offers provide more sudden changes in capital structure, whereas open market buy-backs are smaller in size and spread over several years, thus providing less shock to a firm’s capital structure. This concurs with the findings by Chan et al. (2000), which provide evidence that companies announce share repurchase

programmes around the time of the exercise of executive stock options in order as a way to restructure the firm's capital.

Because debt induces managers to make interim payments to avoid default, it also acts as a disciplinary mechanism to avoid overinvestment in risky projects (Jensen, 1986; Stulz, 1990; Zwiebel, 1996). Edmans (2011) posits that dividend payout will be affected according to the type of debt choice by firms (risky debt or non-risky). This is because risky debt has a disciplinary effect to force managers to pay out cash or face a termination of service, thereby lowering the free cash flows available for dividend payments compared to non-risky debt.

The objective of limiting free cash flows but also reserving enough cash holdings for investments in high return projects is achieved with higher monitoring from debt holders and strong disciplinary action from the board of directors (John and Senbet, 1998; Ozkan and Ozkan, 2004; Harford et. al., 2012). Therefore, the agency cost of the free cash flow hypothesis predicts excess cash flow will be constrained from managerial mismanagement through control mechanisms such as debt and board monitoring.

5.2.4 Corporate Governance

According to Shleifer and Vishny (1997), a divergence of interest between managers and shareholders exists in the absence of an effective corporate governance mechanism. Agency theory claims that the corporate governance role is to assure shareholders that the managers pursue their wealth maximization objectives. In order to mitigate agency problems, firms need to create effective internal systems to act as monitoring mechanisms on managers' actions. Fama (1980) posits that corporate

governance is a significant mechanism in maintaining control and overseeing managerial behaviour in daily operations

This proposition is supported by Demsetz and Lehn (1985) who assume that corporate governance mechanisms are designed to reduce the agency problem through interest alignment in agency relationship. They contend that the main purpose of corporate governance is twofold: first to improve firm performance, and second to resolve the agency problem by monitoring management actions and activities.

According to Sharma (2011) dividend policy is one of the areas where conflicts between managers and shareholders may occur based on free cash flow hypothesis illustrated by Easterbrook (1984) and Jensen(1986). The board of directors is charged to protect shareholders' interests. In this regard, the board of directors has control over payout policy setting on dividend payment and able to reduce the friction in agency relationship (Easterbrook, 1984; Hu and Kumar, 2004). Effective and independent boards of directors are necessary to regulate firms' financial policies and lessen the ongoing friction between upper management and external shareholders (Sharma, 2011).

Corporate governance mechanisms have significant impact in influencing payouts. For example, Hu and Kumar (2004) study the effects of several corporate governance characteristics on corporate payout policy. They argue that entrenched managers choose a payout policy which protects them from the disciplinary actions of shareholders. They predict a positive relation between payouts (dividend payouts and share repurchases) and stock-based compensation (stock options and restricted stock awards). They find strong evidence that the probability of payout and level of payout are significantly and positively related to CEOs' equity-based compensation. However, based on a sample of 2,081 US firms for 1992-2000, the coefficients turn negative when

they reach the entrenchment limit of ownership above 25%.

In a similar way to La Porta et al. (2000), Denis and Osobov (2008) provide conclusion that agency conflicts will increase the probability of cash dividend payouts. By testing the likelihood of dividend payout across developed countries from 1989 to 2002, they find that firms disburse cash via dividends payout to offset the agency cost of cash holding. This hypothesis is further investigated by Sharma (2011) by examining the board characteristics such as board independence, independent directors' tenure on the board, their multiple directorship and directors' compensation packages relate with firms' tendencies to pay dividends. She finds that board independence and directors' tenure positively impact on the dividend payout policy in the likelihood of becoming a dividend paying firm. The findings are related with the service length of external directors when independent directors with longer service record are more likely to propose dividend payment.

Furthermore, Shleifer and Vishny (1986) argue that the presence of large shareholders or blockholders mitigates agency problems by providing a monitoring mechanism, and limits the scope of managerial opportunistic behaviours. However, blockholders can also act to fulfil their private benefits (Shleifer and Vishny, 1997) and reduce managerial incentives (Harford et al., 2008). In line with this, Faccio et al. (2001) report that the high shareholding of a controlling family will result in poor governance and high dividend payouts, especially when the ownership concentration exceeds 20% of the stake of the controlling family. This result suggests that crony blockholders could use high dividend payouts as a channel to expropriate wealth from a firm.

The trend for using payouts as a medium to alleviate principal-agent problems is

still of interest to scholars in various nations. In a recent study by Bohren et al. (2012), the authors find that strong shareholders use dividend payout policy to mitigate the conflict of interest with minority shareholders. Using a sample of Norwegian banks and concentrating on various organisational forms, they conclude that dividend policy is used to discourage opportunistic power abuse in shareholder conflicts between owners and non-controlling shareholders by imposing a disciplinary mechanism on the abuser at a later stage.

5.2.5 Investment Opportunities

There are conflicting views on what drives firms' growth. In their seminal paper, Modigliani and Miller (1956) argue that firm value is determined by operating and investment decisions, while financing or payout decisions are not the main drivers. However, in a survey of 384 CEOs and CFOs, Brav et al. (2005) find that dividend policy is set concurrently or predetermined before setting firms' investment choices. This suggests that in practice, corporate managers do not treat payout as residual cash flow after funding the investment projects of firms.

As pointed out by Jensen (1986) and Stulz (1990), firms with free cash flow and lack of investment opportunities are more prone to managers using their discretion to spend on private benefits or empire building. DeAngelo and DeAngelo (2006) propose that firm choose the payout policy as a way of returning excess cash to shareholders. Their work on life-cycle theory promotes the agency view illustrated in Jensen (1986) and the view of firms' growth prospects from Grullon et al., (2002). Under life-cycle theory, firms will continually adjust dividend payments according to investment opportunities available over time. The theory predicts that young companies with

abundance investment prospects prefer low cash payouts because retained earnings are geared towards financing investment projects. As such firms reach maturity stage, their internally generated funds exceed investment opportunities and firms increase dividends to disburse surplus cash and mitigate agency conflicts from free cash flow. DeAngelo and De Angelo (2006) find that a firm's likelihood to make dividend payment has positive association with the ratio of firm's earnings to total shares outstanding.

Following a similar argument, Fama and French (2001) note that newly listed firms are not dividend paying firms because of low earnings, are of small size and have good investment opportunities. They find that these newly listed firms have high asset growth rates and a high ratio of market value to book assets as the proxy for investment prospects. Using a sample of US firms for 1978-1999, their results show that non-paying firms invest at a higher rate than dividend-paying firms, invest more in R&D and are on average ten times smaller than dividend-paying firms.

For multinational firms, Desai et al. (2007) show evidence of parent firms repatriate cash dividends from foreign affiliates in order to cater for the purpose of domestic investment. This is due to the high cost of raising external debt to fund firms' long-term project spending. The authors also report that highly levered domestic firms with attractive investment opportunities have a higher propensity to repatriate dividends from foreign affiliates. This is consistent with the hypothesis that internal cash dividends are more attractive to finance capital expenditure because of the low cost compared to raising external capital.

The type of investors has also been linked to firms' payouts. Gugler (2003) predicts that the effects of the identity of blockholders on dividend payout policy depend on the investment opportunities available to firms. Majority shareholders of

firms with high growth prospects could optimally wait for dividend payouts in lieu of high return projects, which could take some time to realise. In contrast, firms with low investment opportunities could be pressed to disburse the excess cash flow by large shareholders. The author hypothesises that investment, R&D and dividend payments are inversely associated with each other, and he reports that firms with good R&D expenditure have significantly lower dividend payouts. These findings are consistent with La Porta et al. (2000) who conclude that corporate insiders could force management to disburse excess cash flow if their legal rights allow them to do so.

5.2.6 Conclusion

This section has discussed the determinants of corporate payout policy based on the propensity to pay and the choice between dividends and share repurchases. Prior studies have illustrated the dividend dilemma and how payout policy is determined by upper management. As Jensen and Meckling (1976) suggest, corporate financial policy is one of the areas where agency conflict between managers and shareholders could arise. Shareholders are concerned with high cash reserves and how management utilises surplus cash. Therefore, it is important to study the payout policy from the agency cost perspective to examine how CEO compensation influences firms' payouts.

This review of the literature on payout policy shows that research has identified the determinants of payout policy. There are substitution between dividend payouts and share repurchases (Dittmar, 2000), signalling true share price for shares trading below market value (Ikenberry et. al., 1995) and due to the free cash flow problems (Mitchell and Dharmawan, 2007).

5.3 Data and Methodology

This section investigates the link between corporate payouts and executive compensation among UK FTSE 350 firms (financial and non-financial firms). Prior literature has provided the association between payout policy and stock incentives in executive compensation packages predominantly of non-financial firms and in a US context. Therefore, because of the shortage of executive compensation and payout policy research based on UK evidence, this present study will focus on UK firms and practices, and provides more current UK data.

The use of payouts to return excess cash to shareholders has become a topic of considerable debate among scholars. Because firms commonly opt for dividend payouts or share repurchases as mechanisms for disbursement, the characteristics of each payout type need to be explored. This is because the trend for dividend payments and share buy backs is argued as complementing, or substituting for, one another (e.g. Dittmar, 2000; Fama and French, 2000; Grullon and Michealy, 2002).

5.3.1 Data Sources

This section provides a discussion on the measurement of each payout attribute and independent variable. The payouts variables are replicated based on Fenn and Liang (2001) study which are determined as dividend payout, share repurchases, total payout and a payout dummy for the purpose of classifying between paying and non-paying firms. Following Fenn and Liang (2001), dividend payouts are measured by cash

dividends on common stock divided by the market value of common stock. The data on dividends and share repurchases are obtained from Datastream for 183 UK firms for 1999 to 2008. The variables are presented in Table 5.1.

Share repurchases are measured by sum of spending on the purchase of common and preferred stock minus the reduction in the value of the net number of preferred stock outstanding, following Grullon and Michealy (2002). Total payouts are the sum of cash dividends and share repurchases. A payout dummy is created if a firm made payouts or 0 if none were made for the year across industries in UK firms. The data are obtained for the three payout measures, that is, dividend, repurchase and total payout. Total payout is included following Fenn and Liang (2001) and Akhigbe and Whyte (2012) to cater for firms without specific dividend or share repurchases target. This is also to be consistent with Fama and French (2001) findings that total payouts increases for firms with both option of dividend or share buy back.

As payouts vary across firm, the data contains both non paying and dividend paying firms. For this analysis, a Tobit regression model is used to estimate the relationship between payouts and stock incentives as payouts variable of dividends, share repurchases and total payouts have minimum value of 0. Meanwhile, logistic regression is used to analyse the relationship between the payout dummy and the predicting variables. The focus on free cash flow problems and other determinants are discussed in the section below for the development of the hypotheses, mainly regarding the attributes of executive stock incentives, corporate debt, excess cash flow, investment opportunities and corporate governance. Fenn and Liang (2001) use three measures of free cash flow, which is net operating cash flow minus interest expense. Cash flow is defined as earnings before interest, taxes, depreciation and amortisation minus capital

expenditure and divided by total assets.

Stock incentives are measured according to shareholding, stock options, LTIPs and total equity portfolio. Following Akhigbe and Whyte (2012), share ownership is defined as the ratio of shares held by a CEO over number of shares outstanding, and divided by total CEO compensation for alternative measurement. Stock options are defined as the total number of stock options held by a CEO divided by the number of shares outstanding, and also divided by total CEO compensation. Similarly, LTIPs are measured by total LTIPs received by a CEO divided by the number of shares outstanding, and divided by total CEO compensation. Total portfolio is measured as the total equity portfolio held by a CEO divided by the number of shares outstanding.

In order to measure firm size, firm net sales are used as the proxy. Natural logarithm values are used in the analysis in order to control for extreme values and ensure the results remain unbiased. Total annual compensation is calculated as the sum of the salaries, bonuses, other annual compensation, the value of restricted stock during the year, the value of restricted stock granted during the year, the Black-Scholes value of new stock options granted during the year, long-term incentive payouts, and all other compensation paid to the top five executives of the firm following Ortiz-Molina (2006).

Measures of corporate governance are indicative of powerful and entrenched executives and include of CEO/chair duality in order to evaluate executive power following Wade et al. (1990) and Rechner and Dalton (1991). The Ratio of NEDs to executive directors is used to assess corporate control (Beatty and Zajac, 1994) and board size as a commonly used indicator for quality of governance (Jensen, 1993).

Firm risk is calculated following volatility of the 36-month share price of a firm, that is, the standard deviation of monthly stock returns over the period. Using stock

return volatility to proxy for firm risk is common (Core et al., 1999; Coles et al., 2006). With regard to leverage, two measures are used, that is, book leverage and market leverage following Ortiz-Mollina (2006), by dividing corporate debt with total assets. Firm leverage is the ratio of the book value of total debt to the book value of total assets (Yermack, 1995; Brick et al., 2006).

Companies' annual reports are a common resource tool when examining compensation and corporate governance details, and they are freely and cheaply accessible and open to public scrutiny (John and Senbet, 1998; Guay, 1999). They are also worthwhile and reliable sources of data which provide clean disaggregated information on salaries, bonuses and other long-term incentive plans of CEOs which can be easily matched to company performance data which have been reported by Ozkan and Ozkan (2004) and Ozkan (2011). Following Conyon et al. (2005) and Ozkan (2009), CEOs' remuneration data have been collected from the director remuneration report sections in the annual report sections of the firms' annual reports.

This research adopts a time-series sampling of firms by selecting a sample from a much larger group, that is, the entire population of large companies in the UK. This comprises 350 companies listed on the FTSE 350 index. The rationale behind this selection is because the sample consists of a wide range of large corporations which are distributed across the UK and operate in various industries and market sectors. This creates a substantial size for the sample, which is likely to increase the probability of the sample being representative of the population. By taking a panel data approach, the in-depth analysis of regression is able to explain the variability in the longer term than a single time period. It is also noted that companies who are listed on the FTSE have an obligation to publish annual reports, making access to the required data more feasible.

The sample consists of 183 publicly traded companies listed on the FTSE 350. Financial institutions are included except that firms such as pension fund and unit trust companies are excluded from the sample because these firms have few employees, massive financial assets and boards made up entirely of non-executive directors. The data includes remuneration details relating to the boards of directors, including CEOs and chairmen. All these variables are extracted from company annual reports from 1999 to 2008. The firms in the sample cover most sectors of the economy and are the most highly represented companies.

Data were analysed using statistics data analysis (STATA) 11. Where appropriate, variables are expressed in the natural logarithm of their values to adjust for the non-normality of distribution. There are two stages to the analysis. The first stage is descriptive analysis, which highlights and illustrates graphically some of the associations between the variables. The second stage involves panel regressions. Both univariate (i.e. pairwise correlations) and multivariate analysis are used. Multivariate analysis based on Tobit and logistic regressions are mainly employed to test the research hypotheses. As part of the robustness check, fixed effect regressions are used.

The Tobit regression model is used for three payout measures: dividend payout, repurchase payout and total payout:

$$y_i = \begin{cases} y_i^* & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases}$$

$PAYOUT_{it} = CEO\_SHARE_{it} + CEO\_OPTION_{it} + CEO\_LTIP_{it} + CEO\_PORT_{it} + CFINVEST_{it} + CFOPER_{it} + MTB_{it} + DEBT_{it} + INVEST_{it} + FIRM\_AGE_{it} + SIZE_{it} + RISK_{it} + LOG\_BOARD_{it} + FRACTIONEXD_{it} + CEO\_DUALITY_{it} + \varepsilon_{it}$

Where:

CEO_SHARE_{it} = CEO shareholding divided by common shares outstanding

CEO_OPTION_{it} = CEO stock options divided by common shares outstanding

CEO_LTIP_{it} = CEO LTIPs divided by common shares outstanding

CEO_PORT_{it} = CEO total portfolio divided by common shares outstanding

$CFINVEST_{it}$ = Net cash flow minus cash flow from investing activities/assets

$CFOPER_{it}$ = Net cash flow minus cash flow from operating activities/assets

MTB_{it} = Market-to-book value

$DEBT_{it}$ = Long term debt divided by sum of market value and long-term debt

$INVEST_{it}$ = Capital expenditure divided by total assets

$FIRM\_AGE_{it}$ = Incorporation date to the end of accounting year date

$SIZE_{it}$ = Natural log of sales

$RISK_{it}$ = Standard deviation of monthly stock price returns for prior 36 months

LOG_BOARD_{it} = Natural log of board size

$FRACTIONEXD_{it}$ = Fraction of non-executive directors to board size

$CEO\_DUALITY_{it}$ = CEO and chairman duality dummy

ε_{it} = Error term

The propensity to pay out is measured as the dummy variable 1 if a payout is made and 0 otherwise. The following logistic regression is used to analyse the relationship between propensity of payout and the predicting variables:

$$\mathrm{PAYOUT}_{\mathrm{DUM}}, \mathrm{E(y)} = \frac{\exp(\mathrm{CEO}_{\mathrm{SHAREit}} + \mathrm{CEO}_{\mathrm{OPTIONit}} + \mathrm{CEO}_{\mathrm{LTIPit}} + \mathrm{SALBONUSit})}{1 + \exp(\mathrm{CFINVESTit} + \mathrm{CFOPERi} + \mathrm{DEBTit} + \mathrm{RISKit} + \mathrm{LOG}_{\mathrm{BOARDit}} + \mathrm{FRACTIONEXDit} + \mathrm{CEO}_{\mathrm{DUALITYit}})}$$

MTB or market to book value measures for growth opportunities and INVEST measures for R&D and investment in capital expenditure in order to measure the

investment opportunities of the sample firms. SIZE is measured as the log of a firm's assets and RISK is defined as the standard deviation of monthly stock price returns for the 36 months prior to the sample year.

Table 5.1: Variables definitions

Variables	Description
Dividend payout	Dividend yield
Repurchase payout	Share repurchase divided by market value of common shares outstanding
Total payout	Dividend and repurchase of common shares divided by market value of common shares outstanding
CEO shareholding	CEO shareholding divided by common shares outstanding
CEO shareholding 2	CEO shareholding divided by total portfolio
CEO options	CEO stock options divided by common shares outstanding
CEO options 2	Directors' stock options divided by total portfolio
CEO total equity	CEO equity portfolio (toptions + toptionsnew + tshares + tltip + tltipnew)/common shares outstanding
CEO LTIP	CEO LTIPs divided by common shares outstanding
CEO LTIP 2	CEO LTIPs divided by total portfolio
CEO cash compensation	Log of salary and bonus
Operating cash flow	Net cash flow minus cash flow from operating activities/assets
Investing cash flow	Net cash flow minus cash flow from investing activities/assets
Cash holding	Ratio of cash and equivalents to total assets
Firm size	Log sales
Firm age	Firm age (incorporation date to the end of accounting year date)
Market-to-book	Market-to-book value
Market debt	Long-term debt divided by the sum of market value and long-term debt.
Book debt	Long-term debt divided by total assets
Risk	Standard deviation of monthly stock price returns for the 36 months prior to sample year
Log board size	Log board size
Fraction non-executive	Fraction of non-executive directors to board size
CEO duality	CEO and chairman duality dummy

5.3.2 Hypotheses Development

The nature of managers' compensation contracts could influence firms' payout policies. Lewellen et al. (1987) investigate the impacts of the percentage of cash compensation and the percentage of equity compensation on dividend payout ratio. They report a positive association between cash compensation (salary and annual bonus) and negative but insignificant results for equity compensation. Building on these results, Lambert et al. (1989) examine the effects of managerial stock options on corporate dividends. Analysing 221 US firms, they report that firms cut dividend payouts when they adopt the stock options in compensation contracts. The inverse relationship is due to the cost associated with dividends when managers hold a stock option. This suggests that CEOs with stock options outstanding will reduce dividend payouts because these are costly to their stock option holdings. Other studies find that managers with high stock option holdings value earnings per share (EPS) more than other managers. These managers seek to protect themselves from the dilution of EPS value which may arise from dividend payouts (Bens et al., 2003). Fenn and Liang (2001) extend the work of Lambert et al. (1989) and study the effects of managerial stock incentives on dividend and share repurchases. They posit that CEO shareholding encourages an alignment of interest with shareholders especially for firms with high free cash flow. Therefore, they hypothesise that better managerial alignment through stock incentives increases the total payouts of firms. Because shareholders are concerned with the return on their investment and how self-interested managers have tendencies to expropriate wealth, CEO ownership is a mechanism to mitigate the problem of excess

cash flows. The authors find that managerial ownership is positively related to a high payout for firms with low investment opportunities. They also find that stock options are negatively associated with dividends but positively related to share repurchases. They attribute these findings to managers using their stock option holdings to decide on cash payouts without affecting their stock option values. There are other studies (e.g. Rozeff, 1982) which find a negative relationship between insider shareholding and dividend payouts because of the substitution effect of dividend incentive alignment through share ownership. Meanwhile, Fenn and Liang (2001) report that managerial share ownership positively influences the payouts of firms with greater agency problems in sample firms with low management share ownership and few investment opportunities or high free cash flow. They conclude that management share ownership mitigates free cash flow problems within firms. In contrast, Hu and Kumar (2004) find a negative relationship between the fraction of CEO share ownership and the level of dividend payments.

Because these studies only focus on shareholding and stock options, it is essential to study the effects of other forms of compensation such as LTIPs because the UK has increased other types of stock incentive following the Greenbury Report (1995). LTIPs could be related to corporate payout policy because linking other forms of compensation also encourages CEOs to align with shareholders' value maximisation pursuits. Therefore, high CEO ownership and LTIPs will increase the dividend payouts of firms, whereas stock options could reduce dividend payouts but increase share repurchase payouts.

Hypothesis 1a: Stock options will induce managers to reduce cash dividends because of the dilution of value per share. Thus, there is a negative relationship between executive

stock options and dividend payouts.

Hypothesis 1b: On the other hand, share repurchases have a positive relationship with stock options when there is high stock option ownership by management.

Hypothesis 1c: CEO ownership, LTIPs and cash compensation will induce a higher alignment of interest with shareholders and reduce free cash flow problems. Thus, there is a positive relationship between shareholding, LTIPs, cash compensation and dividend payouts of firms.

The agency conflict of excess cash flow has been well documented when firms misuse free cash flow because there is a lack of investment opportunities (e.g. Jensen, 1986; Stulz, 1990; Grullon et al.; 2002; De Angelo and De Angelo, 2006). During a high growth and business expansion cycle, the accumulation of cash reserves will be a concern of shareholders. This is because managers tend to disgorge the excess cash flows either by spending on private perquisites, making ludicrous investments with low returns when opportunities are scarce or deploying funds for value-destroying acquisitions (Jensen, 1986; Grullon and Michealy, 2002). Therefore, shareholders need to limit managers' access to free cash flows by cash payouts.

To examine this hypothesis, Jaganathan et al. (2000) test the cash payouts from dividends and share repurchases to distinguish between permanent and fluctuating cash flows. They argue that dividends are recognised as a commitment or bonding mechanism from which shareholders expect a steady stream of payments, whereas share repurchases relate more to temporary surplus cash. By using estimates of aggregate share repurchases based on announcements and the actual value of repurchases, they find that share repurchase payouts are consistent with extraordinary cash flow because of the business cycle whereas dividend payouts are stable over the years.

Given that the nature of cash flows possibly influences the type of payouts, sustainable cash flows will increase the level of payouts. Cash dividends will increase for firms with stable streams of cash flows such as operating cash flows. However, because share repurchases depend on flexibility and the availability of surplus cash, these are more likely to be influenced by investing cash flow because this is more usually subject to the business cycle.

Hypothesis 2a: There is a positive relationship between operating cash flows and dividend payouts.

Hypothesis 2b: There is a positive relationship between investing cash flows and share repurchases.

As part of operational activities, managers need to make strategic decisions on how to utilise firms' cash holdings (Grullon and Michealy, 2004). This utilisation is important because internal funds are cheaper to finance projects compared with external financing which will incur extra cost to the firm in terms of interest payments. Therefore, high cash reserves could be required for firms to have high liquidity levels. Further, liquid firms will have preferences for higher share repurchase payouts to shareholders because shareholders move to limit excess cash flow (Dittmar, 2000). In addition, the accumulation of cash reserves ensures that managers are able to seek better projects or investment opportunities.

Hypothesis 3: High cash holdings indicate the liquidity of a firm and will have a positive influence on cash return to shareholders in the form of share repurchases compared to dividend payouts.

On the other hand, shareholders could also use debt payments to limit excess cash, which influences the payouts. This is explained in the agency model by Fama

(1986) and Stulz (1990) who argue that excess cash flow creates problems between managers and shareholders. Self-serving managers may mismanage excess funds in value-destroying investments or empty the coffers for their own private benefits. The free cash flow hypothesis posits that shareholders will discourage the raiding of cash flows by deploying several mechanisms to control wayward tendencies. Debt will induce managers to commit to debt repayment and interest payments for the long term and limit managers' access to free cash flows. Because dividend payout depends on available cash, debt will lower the payouts or the likelihood of payouts to shareholders.

Hypothesis 4: Debt payment will limit the available funds which are available to return to shareholders. Therefore, there is a negative relationship between leverage level, dividend payouts and share repurchases.

Fenn and Liang (2001) findings on executive share ownership provide support that share ownerships increases the payouts of firms s in sample firms where subsample of firms with low managerial ownership are tested against firms lacking in investment opportunities or high free cash flow. They conclude that management share ownership mitigates free cash flow problems within firms. In contrast, Hu and Kumar (2004) find a negative relationship between the fraction of CEO share ownership and the level of dividend payments.

A compliant board will have a low influence over a firm's decision-making and policy-setting agendas. When the control and monitoring mechanisms fail because of the veto power of the firm's CEO, shareholders will lose out. Therefore, strong corporate governance with an effective and unbiased board will ensure that shareholders' interests are protected from managerial whims. Board size may play a role in influencing payout policy because a larger board will induce incompatible schedules

and conflicting priorities among directors. A CEO's dual role as chairman of the board and CEO of the firm could also magnify conflicts of interest from empire building or pursuing shareholders' interests. Hence, role duality will reduce the level of payouts observed in a firm. Meanwhile, independent directors have less incentive to be compliant to the CEO and are able to offer informed advice to top management (Mehran, 1995). Therefore, a higher fraction of external directors will increase the payout level because directors are more consistent in their desire to give shareholders a wealth maximising return.

Hypothesis 5a: There is a positive association between board size and payout policy because close monitoring depends on the effectiveness of the board.

Hypothesis 5b: There is a positive association between the proportion of external directors and payouts.

Hypothesis 5c: There is a negative relationship between CEO duality and a firm's payout policy.

Firms experiencing major expansion and a growth spurt will require high cash reserves for business expansion and corporate acquisitions. Due to the abundance of investment opportunities, managers may seek to increase cash holdings in order to sustain the growth level. Internal funds could be used to acquire state of the art equipment and to procure land and other resources for multiple ongoing projects. The shareholders will have a trade-off benefit from lower payouts because surplus cash is channelled for various investments. In this case, young companies will have lower payouts versus mature companies with stable growth.

Hypothesis 6: There is a negative association between risk in the form of share price volatility and repurchase payouts.

Hypothesis 7: Firms with low investment opportunities could be pressed to disburse the excess cash flow by large shareholders. Therefore, investment and dividend payments are inversely associated with each other.

5.4 Descriptive Statistics

Tables 5.2, 5.3 and 5.4 provide the descriptive statistics for payouts and predicting variables. Table 5.2 presents the summary characteristics of payouts as dependent variables. Firms are paying average dividends of 3.41% as measured by dividend yield with a standard deviation of 2.61%. Share repurchase on average is 3.3%. The total payout by firms is 4.8% for 1999 to 2008. This shows that the percentage of payouts is relatively low in the UK compared with the US. By the late 1990s, US firms paid dividends between 31.8% and 45.4% of total earnings (Grullon and Michealy, 2002).

Descriptive statistics for CEO pay are provided in Table 5.3. CEO shareholding is an average of 0.76% of the total shares outstanding whereas stock options are slightly higher at a mean of 0.78%. LTIPs dominate CEO equity pay with an average of 1.75% of total equity. The average cash pay from salaries and bonuses is £230,000 whereas equity pay is £5.1 million.

Looking at the annual dividend and share repurchases trends in Figure 5.1, it is clear that firms are paying their highest dividends in 2008 and their lowest in 2004. This is attributable to the financial boom and the financial crisis. When firms need cash reserves to withstand the turbulence of the capital market, resulting in heavy losses due to sharp falls in their share prices, most companies cut back on dividend payouts or do not pay at all. The highest paying dividends are those of the financial institutions with

an average of 4.8%. The upward trend in share repurchases shows the increasing popularity of payouts because managers are concerned with the dilution of EPS after dividend announcements when they have large stock options outstanding.

Other findings show that the average firm paying dividends has a board size of eight compared to an average board size of 11 for non-paying firms. Large board size is considered ineffective because board members have various commitments to attend meetings (Hu and Kumar, 2004). A large board could also form an alliance with the CEO and internal directors and could impede the governing body from monitoring and disciplining managers in instances of wrongdoing and from protecting shareholders' interests, consequently influencing payout decisions.

With regard to CEO incentives, CEO shareholding has an average of 0.76% with a minimum of 0% and maximum of 33%. This shows that director ownership is lower compared with Khan (2007) for UK counterparts from 1999 to 2008. CEO compensation incentives show the mean shareholding as 7.6% and the average of stock option grants average at 7.8% of the total number of shares outstanding. Within CEO total annual compensation, the mean shareholding stands at 24.08% whereas stock options on average make up 40.82% of the portfolio. LTIPs are expected to be a function of payouts because firms are moving towards replacing stock options with LTIPs for long-term performance compensation and the achievement of targets. LTIPs increased during 2003 after the recommendations of the Greenbury Report and mandatory disclosure of directors' remuneration in UK companies' annual reports.

Firms' payout decisions can also be influenced by debt Firms with high debt level are likely to be involved in financial trouble in the future. Furthermore, debt is also a substitute for payouts as debt reduce the excess cash flow and the disbursement of

cash to shareholders alleviate the agency costs of free cash flow (Jensen, 1986). Firms with high debt are less likely to distribute excess cash to shareholders. Bagwell and Shoven (1998) show that highly levered firms are less likely to repurchase. Kahle (2002) reports that dividend-increasing firms have more debts than repurchasing firms, using total debt-to-assets and long-term debt-to-assets as a proxy for financing costs. Dividend-paying firms have more stable cash flows and are more able to increase debt compared to repurchasing firms.

Firms with high capital expenditure should have better investment opportunities and less cash flow, and thus pay out less. Kahle (2002) finds that firms with high levels of cash flow derive greater benefit when distributing cash to shareholders because they are at greater risk of overinvesting. This supports the findings by Fenn and Liang (2001) and Grullon and Michealy (2004) that firms with high levels of excess cash and low growth opportunities return surplus cash to shareholders, thus mitigating overinvestment in value-destroying projects. Kahle (2002) also reports that repurchasing firms have higher ratios of free cash flow to assets than dividend-increasing firms.

Bens et al. (2003) argue that investors and executives tend to focus on the diluted value of EPS rather than basic EPS. Because stock options are usually not protected against dividend payouts, their value falls when dividends are paid (e.g. Hall and Murphy, 2002; Bens et. al., 2003). As a result, prior studies contend that executives of firms with employee stock option (ESO) plans have an incentive to pay out cash through stock repurchases rather than dividends (Fenn and Liang, 2000; Kahle, 2001). The dilutive effects of dividend payouts on total ESOs outstanding leads to the substitution of share repurchases for dividend payouts in a firm's payout policy.

Figure 5.1: Average payouts from 1999 to 2008

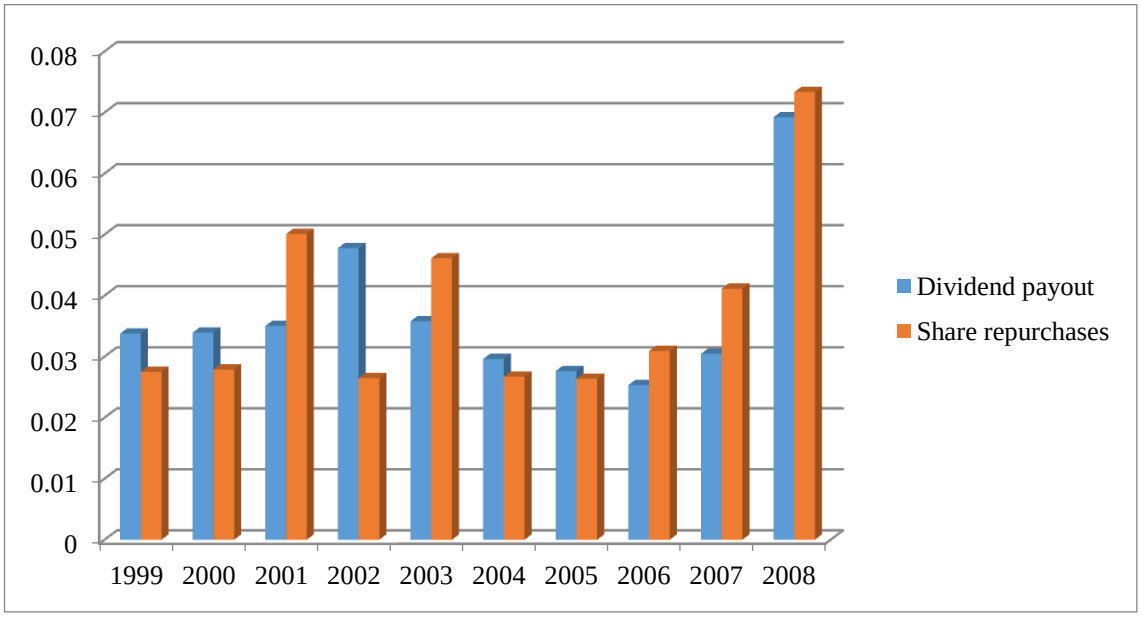


Table 5.2: Summary statistics of payout variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Dividend payout	1595	0.0341	0.0341	0.0000	1.0894
Repurchase payout	1233	0.0330	0.0330	0.0000	0.9307
Total payout	1595	0.0480	0.0480	0.0000	0.9526
Payout dummy	1595	0.9242	0.264697	0.0000	1.0000

This table presents the sample characteristics for 183 firms. The means of the variables are measured for 1999-2008. Variables are defined in Table 5.1.

Table 5.3: Summary statistics of managerial incentives

Variable	Obs	Mean	Std. Dev.	Min	Max
CEO shareholding	1305	0.0076	0.0325	0.0000	0.3300
CEO stock options	1329	0.0078	0.0251	0.0000	0.3066
CEO portfolio	1329	0.0142	0.0379	0.0000	0.3300
CEO cash pay	1674	13.5695	0.6732	9.3634	16.5489
CEO shareholding_2	1305	0.2408	0.2551	0.0000	0.9386
CEO stock options_2	1329	0.4082	2.6022	0.0000	0.6123
CEO LTIPs	1047	0.0175	0.0359	0.0000	0.1583
CEO LTIPs_2	1047	0.4909	0.5646	0.0011	0.3137

This table presents the sample characteristics for 183 firms. The means of the variables are measured for 1999-2008. Variables are defined in Table 5.1.

Table 5.4: Summary statistics of other variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Log board size	1674	0.9779	0.1108	0.6021	1.3617
Fraction non-executive	1674	0.5631	0.1290	0.0000	0.9167
CEO duality	1674	0.9261	0.2617	0.0000	1.0000
Operating cash flow	1674	0.0684	0.0978	-0.8634	0.4000
Investing cash flow	1674	0.0291	0.0986	-0.9775	0.3699
Cash holding	1674	0.0970	0.1061	0.0000	0.7282
Firm size	1674	9.0566	0.7484	5.4498	11.3959
Firm age	1674	97.2353	47.4808	3.0000	195.0000
Market-to-book	1641	3.9091	9.9631	0.0300	194.8600
Market debt	1672	0.2433	0.2263	0.0000	1.0000
Book debt	1672	0.2001	0.1725	0.0000	1.4912
Risk	1595	0.0942	0.0390	0.0237	0.4485

This table presents the sample characteristics for 183 firms. The means of the variables are measured for 1999-2008. Variables are defined in Table 5.1.

5.5 Empirical Results

5.5.1 Univariate Regressions

The univariate table for Tobit regression for dividend payouts in Table 5.5 provides mixed results. CEO shareholding, stock options and LTIPs have negative coefficients at the 1% and 5% significance levels. With regard to CEO shareholding, the expected results are a positive association between share ownership and the level of dividend payouts. The strong and negative results disprove the hypothesis 1c that with higher ownership, managers' interests are more aligned with shareholders' and affect the high dividend payouts to shareholders. In contrast, share options are expected to have a negative association with dividend payouts because managers are concerned with the dilution of options' values as argued by Bens et al. (2003).

With regard to the corporate governance variable, only CEO duality gives strong support to the hypothesis that CEO independence promotes higher dividend payouts. Most of the other predictors show a strong association with dividend payouts. Operating and investing cash flows provide a negative association at the 5% and 10% significance levels. These findings reject the hypothesis 2a and 2b that free cash flows will increase the level of dividend payouts as proposed by Fenn and Liang (2001). Another result about cash holdings did not support the hypothesis that the level of cash will increase the dividend payouts' level as the inverse association suggests. Meanwhile, market debt and book debt coefficients are positive and significant at the 1% level.

Fenn and Liang (2001) and Kahle (2001) argue that the level of stock options affects firms' share repurchases. The univariate regression in Table 5.6 shows positive but insignificant results for both shareholding and stock options, thus rejecting the

hypothesis. Other executive compensation variables also show insignificant results overall and do not support the proposition that share repurchases are linked with managerial share ownership, stock options and LTIPs.

In addition, corporate governance variables do not support the hypothesis. Board size has a negative coefficient but is insignificant. The other variables, the fraction of non-executive directors and CEO duality, have positive results but do not have a strong influence on the level of repurchases, contrary to expectation. The lack of support may be attributable to the insignificant relationship between board monitoring and the level of repurchases as argued by Hu and Kumar (2004).

Univariate results for total payout in Table 5.7 are weak and mixed. Only stock options show a strong and negative coefficient at the 5% significance level. Other CEO compensation variables such as shareholding, LTIPs and cash compensation are relatively insignificant. In a similar fashion as the share repurchase results, corporate governance variables fail to provide strong support to the notion that an effective board and strong corporate governance have an effect on firms' total payouts.

Cash holding shows a positive coefficient at the 5% significance level, supporting the hypothesis 3 that high cash reserves in firms increase the level of total payouts. According to Jensen and Meckling (1976), in order to minimise managers' overinvestment, cash disbursement to shareholders as payouts would alleviate the problem by restricting managers' access to corporate funds.

The propensity of firms to make payouts is tested in the logistic regression shown in Table 5.8. Results for the univariate statistics show that stock options and LTIPs reduce the likelihood of firms making a payout because both coefficients are negative and significant at the 1% and 5% significance levels.

Table 5.5: Tobit regressions of dividend payout

This table presents the Tobit regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of Tobit regression for dividend payout. Explanatory variables are CEO shareholding (Total CEO shareholding divided by common shares outstanding), CEO stock options (Total CEO stock options holding divided by common shares outstanding), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO LTIP (Total CEO LTIPs divided by common shares outstanding), CEO shareholding 2 (CEO shareholding divided by total portfolio), CEO stock options 2 (CEO stock options divided by total portfolio), CEO LTIP 2 (CEO LTIPs divided by total portfolio), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise) . . The p-values are presented in the second lines.

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Managerial incentive											
CEO shareholding	0.0103										
	0.5510										
CEO stock options		-0.0948									
		0.5800									
CEO portfolio			0.0335								
			0.2540								
CEO LTIP				-0.0108							
				0.7480							
CEO shareholding 2					**-0.0102**						
					0.0070						
CEO stock options 2						**-0.0121**					
						0.0340					
CEO LTIP 2							**-0.0065**				
							0.0170				
CEO cash pay								-0.00004			
								0.9740			
Corporate governance											
Log board size									0.0009		
									0.7290		
Fraction non-executive										0.0080	
										0.4450	
CEO duality											**0.0061**
											0.0810
# Obs.	1594	1358	1670	1007	1594	1358	1007	1670	1358	1358	1361

Pseudo R^2	0.0000	-0.0011	-0.0004	0.0000	-0.0010	-0.0099	-0.0017	0.0000	0.0000	-0.0002	-0.0005
Log likelihood	1793.6629	1396.4577	2109.4803	1033.6365	1520.6504	1406.5687	1036.8321	1662.4490	2149.9539	2150.3698	2165.1599
Wald chi^2	0.3600	0.3100	1.3000	0.1000	7.2900	4.4800	5.6900	0.9740	0.1200	0.5800	3.0400

Table 5.6: Tobit regressions of share repurchase

This table presents the Tobit regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of Tobit regression for share repurchase. Explanatory variables are CEO shareholding (Total CEO shareholding divided by common shares outstanding), CEO stock options (Total CEO stock options holding divided by common shares outstanding), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO LTIP (Total CEO LTIPs divided by common shares outstanding), CEO shareholding 2 (CEO shareholding divided by total portfolio), CEO stock options 2 (CEO stock options divided by total portfolio), CEO LTIP 2 (CEO LTIPs divided by total portfolio), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). The p-values are presented in the second lines.

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Managerial incentive											
CEO shareholding	0.0262										
	0.8160										
CEO stock options		0.7444									
		0.4820									
CEO portfolio			0.3551								
			0.1930								
CEO LTIP				0.0411							
				0.8300							
CEO shareholding 2					0.0002						
					0.9950						
CEO stock options 2						0.0305					
						0.4510					
CEO LTIP 2							-0.0057				
							0.4820				
CEO cash pay								-0.0065			
								0.4820			
Corporate governance											
Log board size									-0.0113		
									0.5350		
Fraction non-executive										0.0048	
										0.8900	
CEO duality											0.0053
											0.6820

# Obs.	1128	1026	1008	980	1128	1026	980	1008	1204	1204	1232
Pseudo R^2	-0.0001	-0.0192	-0.0110	0.0000	0.0000	-0.0058	-0.0008	-0.0012	-0.0005	0.0000	-0.0001
Log likelihood	1489.2573	1264.4556	1059.0019	1282.9741	1287.0315	1259.7214	1283.1943	1332.4827	1308.6504	1308.4517	1310.9667
Wald chi^2	0.0500	0.4900	1.7000	0.0500	0.0000	0.5700	0.5000	0.4900	0.3900	0.0200	0.1700

Table 5.7: Tobit regressions of total payout

This table presents the Tobit regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of Tobit regression for total payout. Explanatory variables are CEO shareholding (Total CEO shareholding divided by common shares outstanding), CEO stock options (Total CEO stock options holding divided by common shares outstanding), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO LTIP (Total CEO LTIPs divided by common shares outstanding), CEO shareholding 2 (CEO shareholding divided by total portfolio), CEO stock options 2 (CEO stock options divided by total portfolio), CEO LTIP 2 (CEO LTIPs divided by total portfolio), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). The p-values are presented in the second lines.

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Managerial incentive											
CEO shareholding	0.0308										
	0.6160										
CEO stock options		0.0105									
		0.9680									
CEO portfolio			0.1780								
			0.1760								
CEO LTIP				-0.0196							
				0.7380							
CEO shareholding 2					-0.0137						
					0.3070						
CEO stock options 2						**-0.0153**					
						0.0430					
CEO LTIP 2							-0.0077				
							0.1350				
CEO cash pay								0.0044			
								0.3840			
Corporate governance											
Log board size									0.0048		
									0.6880		
Fraction non-executive										0.0273	
										0.1630	
CEO duality											0.0048
											0.6880

# Obs.	1594	1358	1670	1007	1594	1358	1007	1670	1358	1358	1361
Pseudo R^2	-0.0001	0.0000	-0.0036	0.0000	-0.0009	-0.0073	-0.0014	-0.0006	-0.0001	-0.0009	-0.0001
Log likelihood	1260.1058	915.4178	1293.5376	974.6001	1027.3555	920.0928	877.0533	975.5078	1224.9437	1225.8615	1224.9437
Wald chi^2	0.2500	0.0000	1.8300	0.1100	1.0400	4.0900	2.2400	0.7600	0.1600	1.9500	0.1600

Table 5.8: Logistic regressions of payout dummy

This table presents the Logistic regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of Logistic regression for payout dummy. Explanatory variables are CEO shareholding (Total CEO shareholding divided by common shares outstanding), CEO stock options (Total CEO stock options holding divided by common shares outstanding), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO LTIP (Total CEO LTIPs divided by common shares outstanding), CEO shareholding 2 (CEO shareholding divided by total portfolio), CEO stock options 2 (CEO stock options divided by total portfolio), CEO LTIP 2 (CEO LTIPs divided by total portfolio), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). The p-values are presented in the second lines.

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Managerial incentive											
CEO shareholding	4.4838										
	0.1230										
CEO stock options		**-18.6368**									
		0.0240									
CEO portfolio			-0.2152								
			0.9440								
CEO LTIP				-0.1231							
				0.9940							
CEO shareholding 2					-0.2368						
					0.6930						
CEO stock options 2						**-0.3638**					
						0.0050					
CEO LTIP 2							**-0.7105**				
							0.0030				
CEO cash pay								0.2758			
								0.1090			
Corporate governance											
Log board size									0.2890		
									0.4560		
Fraction non-executive										**-2.1831**	
										0.0120	
CEO duality											**0.9191**
											0.0010

# Obs.	1594	1358	1670	1007	1594	1358	1007	1670	1358	1358	1361
Pseudo R^2	0.0016	0.0906	0.0000	0.0000	0.0005	0.0299	0.0356	0.0047	0.0007	0.0099	0.0113
Log likelihood	-342.2675	-183.6906	-329.0209	-162.3538	-198.5783	-186.8825	-126.4283	-246.4356	-371.8248	-368.4194	-363.2079
LR chi^2	2.3800	5.1200	0.0000	0.0000	0.1600	7.8100	8.6400	2.5700	0.5500	6.2800	10.2700

The fraction of non-executive directors shows a negative link with firms' payout choices because the coefficient is significant at the 5% level. On the other hand, CEO duality increases the chances of firms making payouts to shareholders because of the probability of a better alignment of interests when CEOs are independent of the board. Board size apparently has a positive but weak effect on the propensity of firms to pay dividends or have share repurchases.

5.5.2 Multivariate Regressions

Table 5.9 shows results for the multivariate Tobit regression models. The analysis is based on a linear specification which differs in the utilisation of CEO compensation and corporate governance details. The main objective of the regression is to investigate the impact of CEO compensation, debt and corporate governance characteristics on firm payouts and the extent of their influence. This model also allows for control variables to be included in the analysis.

The first column presents the regression results for dividends. As expected, the results show a negative and significant relationship between dividend payout and stock options. The finding is consistent with the hypothesis 1a that CEOs with high stock options will seek to maximise their wealth and reduce dividend payouts because of dilutive effects on EPS which impact on their stock options' values. A similar result is also obtained for CEO cash pay (total of salary and bonus) where the results are negative and strongly significant at the 1% level. The inverse relationships may be because high CEO cash pay is not beneficial to shareholders because CEOs are more likely not to align with shareholders' preferences for cash payouts.

Table 5.9 : Tobit regressions of payouts

This table presents the Tobit regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of Tobit regression for dividend, share repurchases and total payout. Explanatory variables are CEO shareholding (Total CEO shareholding divided by common shares outstanding), CEO stock options (Total CEO stock options holding divided by common shares outstanding), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO LTIP (Total CEO LTIPs divided by common shares outstanding), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). Control variables are operating cash flow (net cash flow minus operating cash flow/assets), investing cash flow (net cash flow minus investing cash flow/assets), cash holding (ratio of cash and equivalents to total assets), firm size (natural logarithm of firm sales), firm age, market to book (market to book ratio), debt (long term debt divided by market value and long term debt) and risk (standard deviation of monthly stock price returns for the 36 months prior to sample year). The p-values are presented in the second lines.

Variables	**Dividend**	**Repurchases**	**Total payout**
Managerial incentive			
CEO shareholding	-0.0420	-0.3479	0.0456
	0.7590	0.6860	0.8770
CEO stock options	**-0.2795**	**3.7988**	0.4395
	0.0630	**0.0570**	0.4330
CEO portfolio	**0.2577**	0.2710	0.1450
	0.0270	0.7410	0.5740
CEO LTIP	0.1047	-0.1371	0.1832
	0.2340	0.4720	0.2900
CEO cash pay	**-0.0139**	-0.0002	-0.0054
	0.0000	0.9870	0.4080
Corporate governance			
Log board size	0.0039	**-0.0737**	-0.0209
	0.5650	**0.0370**	0.2110
Fraction non-executive	0.0110	**0.1057**	**0.0543**
	0.5560	**0.0400**	**0.0210**
CEO duality	**0.0220**	-0.0251	0.0006
	0.0040	0.3370	0.9800
Other predictors			
Operating cash flow	-0.0866	0.0775	-0.1251
	0.3650	0.7750	0.3630
Investing cash flow	0.1241	-0.1046	0.1855
	0.2770	0.6950	0.2070
Cash holding	0.0756	-0.0765	0.1256
	0.1760	0.3460	0.1210
Firm size	**0.0051**	-0.0011	**0.0054**
	0.0030	0.8640	**0.0580**
Firm age	**0.0001**	-0.00004	**0.0001**
	0.0290	0.7260	**0.0550**
Market-to-book	-0.00003	0.0004	0.00002
	0.9330	0.6490	0.9790
Debt	**0.0828**	0.0435	**0.1198**
	0.0070	0.3490	**0.0060**
Risk	-0.0077	-0.0431	0.0791
	0.9290	0.8740	0.5920

# Obs.	1002	1002	1002
Pseudo R^2	-0.0832	-0.6723	-0.0766
Log likelihood	1267.0952	1158.6574	913.5491
Wald chi^2	6.0900	27.2500	26.2100

With regard to corporate governance characteristics, only CEO duality shows significant results but the positive association does not support the hypothesis 5c that the independent roles of chairman and CEO increase the dividend payout because of the lesser implication of a conflict of interest. The results are interesting because they also reveal that debt payout increases dividend payout.

The second column presents the regression results of share repurchases. The coefficient estimates are positively significant for both measures of stock options. Since the results show that share repurchase payouts do not decline with CEO stock option holdings, this is consistent with the hypothesis 1a that managers prefer share repurchases when they have higher stock option holdings. As for CEO shareholding, total portfolio and LTIP grants, the results are negative but not significant for CEO shareholding and LTIPs, suggesting that these types of CEO incentives do not influence the share repurchase level. Because share ownership and LTIPs are similar in nature, the substitution effects in the form of share options outstanding support the findings of Fenn and Liang (2001) and Akhigbe (2011).

The results for corporate governance show mixed results for the variables of board size, board independence as a proxy for the fraction of non-executive directors and CEO duality. The coefficient for log board size is negative and significant at the 5% level, suggesting that larger boards prefer to keep lower levels of share repurchases, a situation which may be due to a preference for other types of payout. In contrast, the level of share repurchases increases with the level of board independence. There is a

strong and positive association between share repurchases and the fraction of non-executive directors in firms. Strong board governance in terms of monitoring by external directors would ensure that firm commit to cash disbursement to shareholders as proposed by Hu and Kumar (2004). This supports the hypothesis.

Moving on to the regression results for total payouts, the analysis provides another mixed finding. The results show that for managerial incentive, only CEO total portfolio has a positive and strong association at the 1% significance level. Other weak results on CEO shareholding, stock options and LTIPs provide little support for the hypothesis that managerial incentives influence firms' total payout as concluded by the prior research of Jaganathan (2000), Fenn and Liang (2001), Grullon and Michealy (2004), Hu and Kumar (2004) and Akhigbe (2011). CEO cash pay again provides little influence on total payout disbursed by firms because the weak and negative relationship does not imply a link between cash pay and managerial payout policy-setting of firms.

With regard to the corporate governance variables, only the coefficient estimate for the fraction of non-executive directors has strong positive results at the 5% significance level. This finding suggests that board independence may positively influence a firm’s total payout. However, other corporate governance variables as proxies for board size and CEO duality show no link to firms’ total payouts. Because the overall results demonstrate a lack of evidence that corporate governance influences firms’ total payout, it is prudent to note that the basis of strong corporate governance could be counterproductive to firms’ payout policy-setting.

The choice of firms to distribute excess cash flows is the means by which shareholders alleviate agency problems. Table 5.10 presents the logistic regression analysis for firms' propensity to pay out surplus funds. CEO stock options and cash pay

have significant and negative effects on the probability of payout at the 10% significance level. Other equity-based compensation in the form of CEO shareholding and LTIPs are positive but insignificant. These results illustrate that equity-based compensation in the form of share options could reduce the likelihood of firms making excess cash payouts to shareholders. However, high cash pay received in CEO compensation packages inversely related to payout decision could be due to cash bonuses based on share price performance. According to La Porta et al. (2000) and Ostergaard and Smith (2011), firms controlled by non-owner insiders tend to pay lower dividends because they prefer to over-retain excess funds for private benefits.

Looking at corporate governance variables, only board independence has a negative and significant link with the propensity of firms to disburse payouts to shareholders. However, this result does not support the hypothesis that external directors put more pressure on firms' payout policies. The lack of significant results for board size and CEO duality suggest that a strong board and corporate governance mechanism does not translate to firms setting specific payout policies to benefit shareholders. In this regard, firms are able to use corporate governance and equity-based compensation interchangeably in order to align managers' and shareholders' interests in the matter of alleviating the excess cash flow problem.

To achieve robustness, the alternative measure of equity incentives (shareholdings, options and LTIPs) is introduced into the multivariate regression model. The specification for equity incentives (shareholding2, options2 and LTIP2) is based on the proportion to total portfolio. The results in Table 5.11 show that shareholding negatively and significantly affects dividend payout, which is only a weak association in Table 5.9.

Table 5.10: Logistic regressions of payout dummy

This table presents the logistic regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of logistic regression for payout dummy. Explanatory variables are CEO shareholding (Total CEO shareholding divided by common shares outstanding), CEO stock options (Total CEO stock options holding divided by common shares outstanding), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO LTIP (Total CEO LTIPs divided by common shares outstanding), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). Control variables are operating cash flow (net cash flow minus operating cash flow/assets), investing cash flow (net cash flow minus investing cash flow/assets), cash holding (ratio of cash and equivalents to total assets), firm size (natural logarithm of firm sales), firm age, market to book (market to book ratio), debt (long term debt divided by market value and long term debt) and risk (standard deviation of monthly stock price returns for the 36 months prior to sample year). The p-values are presented in the second lines.

Variables	**Dividend**	**Repurchase**
Managerial incentive		
CEO shareholding	**124.5312**	0.9977
	0.0820	0.8920
CEO stock options	**-41.2409**	-5.6046
	0.0140	0.4110
CEO portfolio	25.5577	4.5331
	0.2230	0.4670
CEO LTIP	-5.4310	**21.9924**
	0.7180	**0.0340**
CEO cash pay	-0.5061	0.3068
	0.2720	0.1110
Corporate governance		
Log board size	-1.3172	**1.1408**
	0.4380	**0.0020**
Fraction non-executive	**-6.3871**	-0.0428
	0.0520	0.9560
CEO duality	-0.0991	-0.0855
	0.9380	0.8540
Other predictors		
Operating cash flow	**-27.7001**	**8.0127**
	0.0330	**0.0320**
Investing cash flow	**23.6172**	**-5.9763**
	0.0290	**0.0800**
Cash holding	**-5.3435**	**2.7139**
	0.0270	**0.0070**
Firm size	**0.4801**	**0.1244**
	0.0890	**0.0720**
Firm age	0.0069	-0.0003
	0.4240	0.8530
Market-to-book	0.0030	0.0065
	0.9130	0.5520
Market debt	2.5831	**1.3771**
	0.1470	**0.0010**
Risk	**-39.6446**	**-16.6271**
	0.0010	**0.0000**
# Obs.	858	826
Pseudo R^2	0.4613	0.1116

Log likelihood	-72.9385	-186.4732
Wald chi²	36.4400	131.8200

The results for stock options also provide negative and strong results for dividend payout in Table 5.12.

Given the different magnitude of agency costs between high growth and low growth firms as documented in Fenn and Liang (2001), this analysis is extended by dividing into subsamples of high growth firms and low growth firms as proxied by free cash flow. In particular, if high free cash flow firms face a higher degree of underinvestment and low cash flow firms are plagued with conflicts about utilising excess cash flow, then the subsample can shed light on how managerial ownership and compensation structure affect the payouts of firms.

Tables 5.13, 5.14 and 5.15 present the results for the subsamples. Following Morck et al. (1988) and Fenn and Liang (2001), low ownership firms are defined as ownership below 5%. The median of free cash flow is used to divide high and low cash flow firms. The results in Table 5.13 show that dividend payouts and total payouts are negative and significant at the 1% level for firms with low CEO ownership and high free cash flow. The results are contrary to the findings by Fenn and Liang (2001) who report that a non-linear relationship does not warrant a positive relationship between ownership and payouts because their results are negative but insignificant at the 5% level.

In order to investigate the difference from using the log value of CEO shareholding in monetary terms, the results show the negative relationship for firms with below median and high free cash flow for both dividend and total payouts (Table 5.14). Fenn and Liang (2001) report a negative but insignificant finding for low median

and high free cash flow for dividend payouts but a positive and significant relationship for share repurchases.

Table 5.11: Tobit regressions of payouts - robustness check

This table presents the Tobit regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of Tobit regression for dividend, share repurchases and total payout. Explanatory variables are CEO shareholding 2 (CEO shareholding divided by total portfolio), CEO stock options 2 (CEO stock options divided by total portfolio), CEO LTIP 2 (CEO LTIPs divided by total portfolio), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). Control variables are operating cash flow (net cash flow minus operating cash flow/assets), investing cash flow (net cash flow minus investing cash flow/assets), cash holding (ratio of cash and equivalents to total assets), firm size (natural logarithm of firm sales), firm age, market to book (market to book ratio), debt (long term debt divided by market value and long term debt) and risk (standard deviation of monthly stock price returns for the 36 months prior to sample year). The p-values are presented in the second lines.

Variables	**Dividend**	**Repurchases**	**Total payout**
Managerial incentive			
CEO portfolio	**0.2024**	0.3178	**0.3825**
	0.0000	0.4090	**0.0750**
CEO shareholding 2	**-0.0132**	0.0365	0.0140
	0.0150	0.4700	0.6670
CEO stock options 2	-0.0087	0.1429	-0.0053
	0.1040	0.1170	0.7610
CEO LTIP 2	0.0026	-0.0092	-0.0045
	0.3800	0.4330	0.5840
CEO cash pay	**-0.0150**	0.0058	-0.0045
	0.0000	0.6350	0.5310
Corporate governance			
Log board size	0.0046	**-0.1185**	-0.0232
	0.3840	**0.0130**	0.1220
Fraction non-executive	0.0096	**0.1118**	0.0411
	0.5300	**0.0550**	0.2190
CEO duality	**0.0251**	-0.0228	0.0230
	0.0000	0.3790	0.2210
Other predictors			
Operating cash flow	-0.0703	0.3087	-0.2067
	0.3440	0.4400	0.2220
Investing cash flow	0.1146	-0.2840	0.2531
	0.1960	0.4420	0.1300
Cash holding	0.0703	-0.0945	**0.1469**
	0.0590	0.4490	**0.0480**
Firm size	**0.0048**	0.0007	**0.0049**
	0.0010	0.9290	**0.0590**
Firm age	**0.0001**	0.00008	**0.0002**
	0.0200	0.5550	**0.0100**

Market-to-book	-0.00002	-0.0001	0.00001
	0.8950	0.9490	0.9720
Debt	**0.0784**	0.1203	**0.1193**
	0.0000	0.1090	**0.0010**
Risk	-0.0299	0.6575	0.1580
	0.6090	0.1040	0.3860
# Obs.	1004	1004	1004
Pseudo R^2	-0.0924	-0.3413	-0.0791
Log likelihood	1268.9504	1129.0826	911.6846
Wald chi^2	6.1900	22.1900	25.2300

The substitution effect between dividends and share repurchases is evident for low ownership and high free cash flow where firms reduce dividend payments but increase share repurchases when CEO ownership is below 5%. The findings in Table 4 show that firms with potential high agency costs from high free cash flow will have lower payouts, but substitution effects exist between share ownership and stock options on the choice of payouts.

The results differ for firms with high debt subsamples. Firms with high debt will increase dividends, share repurchases and total payouts when CEO shareholding is below 5%. This suggests that firms using debt as a bonding mechanism to control the excess cash flow problem will induce higher payouts than firms with low debt. This implies the substitution of debt or payouts in order to control for the agency conflicts of free cash flow.

However, the effects are not pronounced for the log of cash compensation in sterling value (Table 5.15). The results show that by comparing high debt and low debt firms, the CEO cash value of shareholdings does not influence the level of payouts across firms in the subsample. This may be attributable to cash compensation and has an insignificant effect on managers' payout decisions.

Table 5.12: Logistic regressions of payout dummy – alternative

This table presents the logistic regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of logistic regression for dividend, share repurchases and total payout. Explanatory variables are CEO shareholding 2 (CEO shareholding divided by total portfolio), CEO stock options 2 (CEO stock options divided by total portfolio), CEO LTIP 2 (CEO LTIPs divided by total portfolio), CEO portfolio (Total CEO equity portfolio divided by common shares outstanding), CEO cash pay (natural logarithm of salary and bonus), log board size (natural logarithm of board size), fraction non-executive (proportion of non-executive directors on board) and CEO duality (CEO duality dummy whereby 1=CEO and Chairman role, 0 otherwise). Control variables are operating cash flow (net cash flow minus operating cash flow/assets), investing cash flow (net cash flow minus investing cash flow/assets), cash holding (ratio of cash and equivalents to total assets), firm size (natural logarithm of firm sales), firm age, market to book (market to book ratio), debt (long term debt divided by market value and long term debt) and risk (standard deviation of monthly stock price returns for the 36 months prior to sample year). The p-values are presented in the second lines.

Variables	**Dividend**	**Repurchase**
Managerial incentive		
CEO portfolio	7.1144	**8.7674**
	0.3400	**0.0680**
CEO shareholding 2	0.4927	-0.0300
	0.7700	0.9670
CEO stock options 2	**-0.6057**	-0.7461
	0.0070	0.1470
CEO LTIP 2	-0.7706	**0.5578**
	0.1360	**0.0960**
CEO cash pay	-0.0348	0.9364
	0.9130	0.0040
Corporate governance		
Log board size	-0.6392	0.4472
	0.4770	0.5440
Fraction non-executive	**-9.1544**	-0.0126
	0.0000	0.9920
CEO duality	1.3749	-0.2252
	0.0520	0.6930
Other predictors		
Operating cash flow	-4.9255	7.5049
	0.4340	0.1730
Investing cash flow	5.0043	-4.5281
	0.3830	0.4170
Cash holding	**-3.7279**	2.7491
	0.0270	0.1590
Firm size	0.1761	-0.0897
	0.2780	0.4610
Firm age	0.0037	**0.0047**
	0.3540	**0.0550**
Market-to-book	0.0048	0.0036
	0.6500	0.9450
Market debt	0.5219	**1.7192**
	0.6140	**0.0260**
Risk	**-27.3102**	-8.3236
	0.0000	0.1210
# Obs.	858	826

Pseudo R^2	0.3854	0.1299
Log likelihood	-104.8682	-187.2712
Wald chi^2	62.8400	134.9300

Table 5.13: Tobit regressions for management ownership variable for subsample of low ownership (<5%) versus low MTB, high free cash flow and debt

This table presents the Tobit estimation to investigate the agency effects from these two subgroups following Fenn and Liang (2001). CEO shares <5% is when CEO shareholding divided by total shares outstanding is below 5%, high free cash flow when above median cash flow, high debt when above the median debt level. The p-values are in the second line.

Variables	**Dividend payout**	**Repurchase payout**	**Total Payout**
Management shares/shares outstanding			
CEO shares < 5%	0.0735	-1.5169	-0.6291
	0.9050	0.3530	0.3610
Market-to-book <1	0.0003	0.0003	0.0007
	0.8280	0.7600	0.7520
# Obs.	214	214	214
Pseudo R^2	-0.0003	-0.0643	-0.0023
CEO shares < 5%	**-0.7201**	-0.8700	**-1.0448**
	0.0000	0.2530	**0.0060**
High free cash flow	**-0.0265**	**0.1193**	0.0145
	0.0220	**0.0060**	0.5710
# Obs.	598	598	598
Pseudo R^2	-0.0088	-0.0385	-0.0048
CEO shares < 5%	-0.2301	**-4.3522**	**-1.0431**
	0.5120	**0.0120**	**0.0080**
High debt	**0.0275**	**0.0626**	**0.0557**
	0.0020	**0.0010**	**0.0010**
# Obs.	620	620	620
Pseudo R^2	-0.0080	-0.2224	-0.0184

Table 5.14: Tobit regressions for management compensation variable for subsample of low (below median) value of shares versus low MTB, high free cash flow and debt

This table presents the Tobit estimation to investigate the agency effects from these two subgroups following Fenn and Liang (2001). Log (£value of CEO shares) is < median when below the median value, high free cash flow when above median cash flow, high debt when above the median debt level. The p-values are in the second line.

Variables	**Dividend payout**	**Repurchase payout**	**Total Payout**
log (£ value of CEO shares)			
£ value < median	-1.0351	-15.1602	-10.1038
	0.8640	0.3580	0.2430
Market-to-book <1	0.0002	0.0008	0.0003
	0.3090	0.7310	0.7150
# Obs.	104	104	104
Pseudo R^2	-0.0060	-0.3103	-0.0076
£ value < median	0.1874	-3.4524	-0.5066
	0.9070	0.6590	0.8920
High free cash flow	**-0.0440**	0.0533	**-0.0661**
	0.0140	0.2330	**0.0850**
# Obs.	309	309	309
Pseudo R^2	-0.0047	-0.0053	-0.0027
£ value < median	-0.7555	-13.3685	-5.6196
	0.7720	0.2660	0.2570
High debt	**0.0320**	**0.0925**	**0.0736**
	0.0010	**0.0660**	**0.0000**
# Obs.	344	344	344
Pseudo R^2	-0.0115	-0.3985	-0.0216

Table 5.15: Tobit regressions management compensation variable for subsample of low (below median) cash compensation versus low MTB, high free cash flow and debt

This table presents the Tobit estimation to investigate the agency effects from these two subgroups following Fenn and Liang (2001). Log (£value of CEO cash compensation) is < median when below the median value, high free cash flow when above median cash flow, high debt when above the median debt level. The p-values are in the second line.

Variables	**Dividend payout**	**Repurchase payout**	**Total Payout**
log(CEO cash compensation)			
£ value < median	0.0102	-0.0011	0.0106
	0.0890	0.9060	0.3820
Market-to-book <1	0.0001	0.0004	0.0004
	0.9420	0.8870	0.8210
# Obs.	96	96	96
Pseudo R^2	-0.0106	-0.0393	-0.0082
£ value < median	-0.0020	-0.0059	-0.0066
	0.5110	0.6820	0.5650
High free cash flow	0.0226	0.0886	0.0126
	0.3640	0.2360	0.7820
# Obs.	243	243	243
Pseudo R^2	-0.0009	-0.0185	-0.0011
£ value < median	0.0085	0.0173	0.0089
	0.2000	0.2120	0.2400
High debt	0.0132	0.0356	0.0244
	0.3350	0.1370	0.1540
# Obs.	236	236	236
Pseudo R^2	-0.0042	-0.1721	-0.0057

5.6 Conclusion

This chapter aims to investigate CEO stock incentives and corporate governance for payout policies. The results show that CEO ownership has a significant impact on payout policies. This is in line with Grullon and Michealy (2002) who argue that managerial ownership increases managers' alignment of interest with shareholders. In contrast, a high level of stock holdings is associated with a lower level of dividend payments and higher share repurchases. Prior studies by Lambert et al. (1989) and Fenn and Liang (2001) find that companies with high executive stock options outstanding will reduce dividend payments and substitute them with share repurchases.

This research also provides support to the hypothesis that high CEO incentives will increase the total payouts of firms because of the alignment of interest between managers and shareholders. When managers are compensated in cash and equity pay, the results show a high association for equity incentives on firms' payouts. Firms will also increase the likelihood of making payouts to shareholders when they are holding excess cash and have a high proportion of external directors. This shows that corporate governance could improve firms' payout policies through their recommendations of payout choice.

In addition to the roles of managerial compensation and corporate governance characteristics in influencing payouts, the extent of effectiveness has also been tested. For a sample of high cash flow and high debt firms, the effect of CEO ownership, CEO stock options and monetary value has pronounced differences. For instance, when CEO ownership is below 5%, firms with high cash flow (i.e. cash flow more than the median) show negative and significant results at the 1% significance level. Specifically, it seems

that firms with low CEO ownership and high cash flow will decrease dividend payouts and total payouts potentially because of a low alignment of interest between managers' and shareholders' preferences for cash payouts.

Finally, the evidence shows that when CEO shareholding is low, dividend payouts will increase for firms with high debt levels. The results hold for share repurchases and total payouts. These results strongly suggest that at a low level of CEO ownership, firms with high debt increase their payouts as increased monitoring from debt holders induces managers to seek further alignment with shareholders in terms of cash payouts. This shows that debt acts as an effective bonding and monitoring mechanism in the absence of high incentive compensation.

When using the monetary value of CEO incentives, high cash flow firms with low compensation value will decrease their dividends and total payouts. This shows that managers prefer high incentives in order to align themselves with shareholders' interests. In contrast, when CEOs receive low compensation but firms have a high debt level, the results show that dividends, share repurchases and total payouts will increase. The results complement existing studies which show that high debt firms have increased monitoring from debt holders, and when incentive alignment is low, debts act as a substitute for disciplining the managers and alleviating agency conflicts between managers and shareholders.

Chapter 6: CEO compensation, corporate governance and cash holding: A UK panel data analysis

6.1 Introduction

Prior studies on cash holdings focuses on the benefits of holding cash reserves in firms to enable them to finance their investments and other liabilities by avoiding the excessive costs of external financing (Almeida et al., 2004; Bates et al., 2009). The costs of internal financing are lower than raising external capital in an imperfect capital market. Further, information asymmetry will cause less established firms to have higher financing costs in contrast with bigger companies with greater accessibility to the capital market (Myers and Majluf, 1984).

This study investigates the determinants of corporate cash holdings and contributes to the literature on the free cash flow hypothesis. Prior established motives for corporate cash holdings reveal that firms hold cash because of transaction costs, information asymmetry and managerial opportunistic behaviour in order to avoid disciplinary action from shareholders. The findings show that managerial shareholding has positive and significant results for the level of cash holding as a proxy for the proportion of cash to total non-cash assets. This is similar to findings by Harford et al., (2009). However, other cash holding variables (cash to sales, cash to market value and log of cash) produce inconclusive results. As expected, corporate governance variables

show strong and positive results regarding the level of cash holdings in the sample firms. The findings support the hypothesis that a high level of insider directors results in a high level of cash holdings because of the slackening of monitoring by executive directors.

The valuation of cash holdings from the shareholders' perspective generates much research interest (Tong, 2007). Faulkender and Wang (2006) examine the relation between corporate financial policies and the value of cash holdings. Elsewhere, Dittmar and Mahrt-Smith (2007) investigate the effect of corporate governance characteristics on the value of cash holdings.

Other research has generally accepted the precautionary motive as a precursor for corporate cash reserves. Kim et al. (1998) develop a model to show that optimal cash holding is obtained when there is a trade off cost between holding short term assets which provide minimal return and advantages of minimizing the cost of external funding by utilising internal funding. Meanwhile, Opler et al.'s (1999) optimal cash holdings model illustrates the benefits of reducing underinvestment problems with sufficient cash reserves. The low return on liquid assets is also compared with returns on investment in different opportunities. The authors also find that high volatility firm or firms with greater growth prospects have higher cash holdings, as evidence for precautionary motive for cash holdings in firms. Another study by Almeida et al. (2004) uses the model to illustrate firms' propensity to save cash out of cash inflows because of financial constraints (the cash flow sensitivity of cash). The authors find that cash flow sensitivity for financially distressed firms' increases during recessions, while the sensitivity for financially healthy firms is not impacted. In comparison, Kyojik and Lee (2012) test whether Asian firms' cash flow sensitivity to risk increases in the long term following a

financial crisis. They find that managers will alter their policies on long-term cash holdings when cash flow sensitivity to risk is high during a financial crisis and mitigate cash flow sensitivity after a financial crisis.

Most of prior empirical studies focus on cross-sectional determinants for cash holdings. The model of optimal cash holdings is developed to include the various drivers for determinants of cash reserves (Kyojik and Lee, 2012). The main models in prior studies illustrate the optimal demands for cash based on costs of transaction as a trade-off between the lower costs of internal funding and the higher costs of external financing. From the transaction costs perspective, the firms' may save on high transaction costs by utilising internal cash holdings which can be identified as the major advantages of cash holdings. A firm generally holds more cash when there is high costs of transaction to convert non-cash assets into cash, whereas it holds a lower amount of cash when the return on cash is lower, which makes opportunity costs higher. As noted by Mulligan (1997), large firms have lower cash holdings as proxy by percentage of sales to offset the transaction costs from asset conversion.

Another aspect of cash holdings motivation points to agency cost of free cash flows. Jensen (1986) argues the existence of large free cash flows increases the friction in agency relationship. Self-interested manager may be disposed to expropriate the surplus funds for personal perquisites or overinvest in negative return projects. Empirical evidence from cross-country studies shows that firms have lower cash holdings when they have strong shareholder rights protection. This is apparent when Dittmar et al. (2003) find that firms in countries with weak shareholder rights have higher cash reserves compared with firms in countries with greater shareholder

protection. They also find that other determinants of cash holdings such as investment opportunities and asymmetric information have little influence within the nations with weak shareholder rights.

For a sample of UK firms, Ozkan and Ozkan (2004) provide evidence that cash holdings have non-linear relationship with executive shareholding. The level of cash holdings decreases when managerial shareholding increases as much as to 24%, become higher as managerial ownership increases to 64%, and lower again when managerial ownership is above 64%. The non-linear association between managerial equity ownership and cash holdings implies the level of managerial entrenchment and cash management policy in firms with weak corporate governance. The study also finds that the cash holdings of firms are dependent on the cash flows and investment prospects, and are inversely related to bank debts and leverage. Elsewhere, Kalcheva and Lin (2007) examine an international sample of firms and provide evidence that external shareholders issue a discount rate when evaluating firms with high cash holdings due to expected divergence of objectives caused by managerial entrenchment. These studies are more focused on the level of managerial ownership as an indicator of managerial entrenchment problems.

Related works by Harford (1999) and Harford et al. (2008) examine the effects of agency conflicts on the utilisation of corporate cash reserves. When the cash reserves is bountiful, US firms seek to invest in value destroying projects (Harford,1999. This supports the agency theory of free cash flows. Harford et al. (2008) extend the studies on corporate governance and report the findings where firms under weaker corporate

governance reduce their cash holdings suboptimally. In contrast, and earlier study by Mikkelson and Partch (2003)report that cash rich firms have better performance return when set against firms with high growth opportunities. . The 2003 study also document that governance characteristics has little influence on the firm performance for high cash holding firms

Most of the previous studies examine the cross sectional effects of cash reserves. However, Bates et al. (2009) investigate using the time-series analysis for cash holdings and the net debt ratio of US firms. They find that the mean of cash-to-net-assets ratio (proxy for cash holdings) have a steady climb for a sample period from 1980 to 2006. Their results show that when firms choose to make dividend payment, they have lower cash balance compared with non-dividend paying firms which maintained high cash balance for internal needs over the study period. This study show that cash holdings are beneficial when they expect the cost to raise external funding is high (transaction costs motives) or when expecting a situation of volatile financial crisis (precautionary motives). The details on determinants of cash holdings are discussed in the following section.

6.2 Determinants of Cash Holdings

Jensen (1986) highlights the problem of internal fund deployment because of the agency conflicts between principals and agents due to differences of interest. Managers tend to use excess cash flow, and shareholders are concerned about the expropriation of

wealth which may reduce shareholder value. Jensen (1986) and Stulz (1990) both use the free cash flow hypothesis to illustrate the managerial decision to spend excess cash based on availability of investment. They predict that shareholders will monitor the managers' utilisation of free cash flows by limiting the available excess cash flows which are at the managers' disposal. This section discusses the determinants of cash holdings in this context.

The costs associated with holding cash reserves are mainly due to managers retaining cash to for their personal motives rather than utilizing cash for principals' wealth creation activities (Jensen, 1986). The costs of holding cash reserves stem from the agency problems between managers and shareholders.

6.2.1 Managerial Stock Incentives

Shareholders are concerned with the deployment of corporate cash holdings when they invest in firms. Managers could have high cash reserves and spend money on value-destroying investments because cash reduces firm risk and increases the propensity for private spending (Opler et al., 1999). Firms hold cash reserves as precautions against unstable future cash flows. When the cash holdings are high, managers tend to expropriate the cash reserves for their own private perquisites or invest in suboptimal projects with negative returns (Kalcheva and Lins, 2007; Denis and Sibilkov, 2009). Shareholders need to protect their investments by monitoring and controlling managers' self-serving behaviour. In order to align the interests of principals and agents, shareholders could implement a compensation contract which motivates managers to pursue shareholders' interests. A suitable compensation structure in the

form of managerial share ownership and stock options induces managers to engage in activities which maximise shareholders' wealth (e.g. Mehran, 1995; Hartzell and Starks, 2003; Ittner et. al., 2003).

According to Jensen and Meckling (1976), share ownership will motivate managers to act in the shareholders' interests because their wealth is also tied to the firm. Opler et al. (1999) provide evidence that managers lean on precautionary motive increases when firms with high agency conflict or asymmetric information have difficulties in raising external capital for investments. The authors argue that risk-averse managers will accumulate cash because cash reduces firms' risks in the face of financial difficulties. They expect a negative relationship between cash holding and volatility. Their results for the cross-sectional analysis of 1,048 US firms from 1971 to 1994 show a negative and significant coefficient for industry sigma, which is defined as the mean of cash flows over assets for the preceding 20 years.

Both models by Jensen (1986) and Stulz (1990) propose free cash flow hypothesis to posit on condition where managers with access to free cash flows will expropriate the liquid assets for their own private perquisites, which do not serve shareholders' wealth maximisation goals. Further, Blanchard et al. (1994) argue that managers will seek to invest in value-destroying projects and accumulate cash to entrench themselves. Based on agency theory, Dittmar et al., (2003) provide proof that shareholders' rights influence the variation of cash holdings in a firm.

In their study for UK counterparts, Ozkan and Ozkan (2004) reveal how managerial shareholding, proportion of external directors on board and shareholders' identity are related to cash retained by firms. They find a non-linear link between

executive ownership and cash holdings, indicating that at a higher level of ownership exceeding 5% managers become entrenched and exhibit the divergence of objectives within agency relationship. Self-serving managers have an incentive to retain larger cash reserves as they are looking to maximimize their personal gain. In contrast, Drobetz and Grunniger (2006) examine a sample of Swiss firms and find that a higher percentage of managerial ownership leads to lower cash holdings, a finding which they attribute to reduced agency conflicts between managers and shareholders.

Other types of managerial equity incentives such as LTIPs have not been widely explored although LTIPs provide similar benefits to managers as share ownership. When shareholders seek to align managers' interests with their own, they have to design compensation contracts which motivate managers to maximise shareholder wealth. Jensen and Meckling (1976) posit that managerial stock options increase risk taking for risk-averse managers. However, LTIPs have been increasingly used to reward the managers in UK firms since the Greenbury Report in 1995. In particular, LTIPs focus on benchmarks of firm performance. Because holding high cash reserves will increase the likelihood of private spending by managers, LTIPs provide an incentive for managers to seek shareholder value maximisation activities by deploying cash in an efficient manner. Therefore, LTIPs will have a U-shaped relationship with cash holdings based on the prior findings on share ownership because of the similar nature of LTIPs and share ownership. Stock options provide an incentive for risk-averse managers. Harford et al. (2009) provide evidence of a positive link between stock options and the level of cash retained in firms. Therefore, the effect of executive equity compensation as an incentive alignment mechanism is to ensure that managers pursue shareholders' wealth

maximisation goals and to act as a precaution against future fluctuations in cash.

6.2.2 Corporate Governance

Role duality occurs when a CEO holds the position of chairman of the board in a firm. Fama and Jensen (1986) and Boyd (1994) argue that an individual who holds the top two positions in a firm will exert greater control and influence on business activities and decision-making. Therefore, the directors in a board chaired by the CEO are expected to have less power over decision-making, which leads to suboptimal internal governance (Morck et al., 1989). In contrast, boards with non-executive or independent chairmen are expected to have greater autonomy in controlling decisions and monitoring, thus providing better internal governance to curb managerial opportunistic behaviours (Weidenbaum, 1986). Thus, a strong board will provide better monitoring and alleviate the problem of excessive cash holdings or inappropriate managerial use of excess cash.

In this regard, shareholders rely on internal governance to provide monitoring for managers. Prior studies offer mixed evidence on cash holdings from the agency conflicts perspective. For example, Opler et al. (1999) find that managers retain cash which serves their precautionary motive against cash flow shock for internal financing instead of raising costly external capital. Similarly, Mikkelson and Partch (2003) note that a high level of cash reserves does not adversely affect firm performance, indicating that cash reserves enhance firm value and are not a source of the agency problem between managers and shareholders. In contrast, Harford (1999) argues that shareholders should

be wary of extortionate cash reserves, and provides evidence that cash-affluent firms have a higher propensity to invest in value-destroying acquisitions. Dittmar and Mahrt-Smith (2007) show that the value of additional dollars of cash retained is discounted for firms with rife agency problems. Similarly, Hanford et al. (2008) study on shareholder right show the devaluation of firm value and lower Tobin's Q for firms with poor governance.

Cash holdings also facilitate overinvestment or unsuitable private spending by managers (Kalcheva and Lins, 2007). The economies of scale for raising external funds encourage firms to hold cash as a buffer and avoid frequent external fund raising (Lee et al., 1996; Kim et al., 1998; Dittmar et al., 2004). However, the cost of holding liquid assets is their low return. There is also a tax disadvantage to holding cash because the accrued interest income will be taxed twice (Drobetz and Gruniger, 2005).

Ozkan and Ozkan (2002) study a sample of UK firms and find that the level of cash reserves are inversely associated with managerial shareholding at a low level of ownership and reversed at a higher level of ownership. The U-type relationship between managerial shareholding and cash reserves indicates that at a lower level of ownership, managers are not inclined to hoard cash but increase the tendency to do so when they become more risk averse because of high ownership.

Ozkan et al. (2007) study legal and ownership structures with regard to cash holdings using cross countries sample of UK, French, German and Japanese companies. The authors hypothesise that countries with strong legal mechanisms and creditors' protection face stronger insolvency threat if they experience liquidity constraint and will caution companies to hold higher cash reserves to counteract this. They find support for

the view that the legal and institutional structure affects the level of cash retained. They attribute the inverse association between shareholder's identity and the level of cash holdings is because of the mounting influence of large shareholders and managerial incentives to hold high cash reserves which reduce the agency costs of external financing.

6.2.3 Cash Flows

Prior literature on cash holdings finds mixed evidence on the association between firms' cash holdings and cash flows. In a study to find the impact of changes in cash holdings on cash flows, Almeida et. al. (2004) document that financially restricted firms conserve cash compared to cash rich firms because cash holdings are affected by cash constraints. Bao et. al. (2012) agree with their conclusion that firms increase cash holdings when they have stable cash flows. In contrast, Riddick and Whited (2009) report an inverse association for the cash flow variable.

Following the precautionary model, Bates et al. (2009) and Kyojik and Lee (2012) argue that firm raise the cash reserves when expecting financial turmoil. When a firm has negative cash flows, it has to abandon negative NPV projects in order to utilise the productivity of physical assets in place (Riddick and Whited, 2009). However, Bao et al. (2012) contend that firms will not terminate negative NPV projects because of legally enforceable contracts and act to dispel the discontent in the capital market. Managers will also not terminate bad projects in order to maximise their personal benefits and overinvest in risky projects (Jensen, 1986). Further, Jensen (1986) and Pinkowitz et. al. (2013) contend that firms affected by severe agency conflicts hoard the

cash when they are lacking profitable investment and management does not return cash to shareholders.

Opler et al. (1999) use their data to examine whether cash hoarding is preferable when there is available excess cash for disbursement. . They find that most firms hold large cash reserves through piling free cash flow, while spending on new projects and investments is slightly higher because of the excess cash. The authors also report that cash flow uncertainty induces managers to hold more cash reserves by measuring the cash flow standard deviation as a proxy for cash flow riskiness. Similarly, Ozkan and Ozkan (2004) posit that higher cash flow variability will induce managers to hold higher liquid assets in order to mitigate the costs offinancial distress. They measure cash flow volatility as the standard deviation of cash flows over mean of total assets of the firm and find contradictory results where liquidity adversely affects the cash holdings of firms.

6.2.4 Investment Opportunities

Myers and Majluf (1984) posit that cash retention is important when there are information asymmetries between firms and capital markets. They suggest that friction between markets and firms results in the mispricing of debt and subsequently impose higher cost of capital for firms. Thus, firms with high asymmetric information could forego profitable projects if cash holdings are low because of the high external financing costs. Therefore, cash holdings provide an internal funding alternative and offer cheaper costs for high growth firms to fund their investments. In this regard, Myers (1977) provides the pecking order theory whereby managers prefer internal cash to raising

funds externally for investment financing.

Following this pecking order theory, Opler et al., (1999) predict that when firms face liquidity constraint, the managers have to forego better projects. They find that firms with high growth prospects and volatile cash flows hold large cash reserves and less illiquid assets. This is because of the lower cost of financing using free cash flows compared with external sources of financing. Similarly, Dittmar et al. (2003) compare the international data on governance variables and report that firms have higher cash holdings when they have high R&D expenditure and high market-to-book ratios.

Investment opportunities are proxied by R&D expenditure over sales by Opler et al. (1999). The measurements of investment opportunities compared with growth opportunities are relatively similar. Ozkan and Ozkan (2004) deploy the market-to-book ratio as proxy for growth. They find that firms with high investment availability retain large cash level when managerial shareholding is lower due to the transparency of information flow between the firm and public.

Harford (1999) predicts that firms with high cash reserves will make value-decreasing investments because managers seek control of the larger operating assets. This follows Jensen's (1986) free cash flow hypothesis that managers will seek to overinvest in negative NPV projects when they have control of the free cash flows.

6.2.5 Risk

Liu and Mauer (2011) estimate that corporate cash holdings are determined by CEO risk-taking incentives (vega), a situation which highlights the problem of stockholder-bondholder conflicts. The authors contend that managers awarded with high

level of stock options are encouraged to seek higher risk projects which are expected by bondholder. Therefore, the firms require high liquidity to avert bankruptcy. They report a positive association between CEO risk-inducement incentives (vega) and the level of cash holdings in firms. Liu (2011) points that a positive relationship between the elasticity of CEO compensation to stock price volatility (vega) and cash holdings can be explained by the contracting hypothesis that bondholders expect firms to have larger cash balances when engage in riskier ventures as an insurance against future bankruptcy threat.

Ozkan and Ozkan (2004) measure cash flow variability to predict that companies facing high fluctuation in cash flows movement require more cash holdings to offset against financial distress costs. Using the cross-sectional regressions method, they find that a shock on cash flow positively influences cash holdings and confirms their hypothesis. They also note that firms will readjust the levels of cash holdings consistently and quickly in order to reach their targeted cash ratio regardless of the costly readjustment process.

6.2.6 Firm Size

Opler et al. (1999) find that firms have higher cash holdings when they are smaller and have volatile cash flows. The authors attribute this to the lower cost of financing using cash reserves because smaller firms have limited access to the capital markets and face higher costs when raising funds from external sources. Kalcheva and Lins (2007) use firm size as a control variable in their regression analysis against the corporate governance mechanism for cash holdings.

In the context of Japanese companies, Ozkan et al. (2007) also provide evidence that smaller firms have higher cash holdings because such holdings are easier to dissolve in the event of bankruptcy. The authors conclude that the precautionary motive of holding cash is more prevalent in Japanese companies compared to firms from the UK, Germany and France. Their finding supports the panel models study by Drobetz and Kruger (2006) which finds that Swiss firms have a positive relationship between firm size and the level of cash reserves.

6.2.7 Dividend Payout

Transaction costs could be lower for firms with better access to capital markets. For instance, firms with access to outside financing will be subject to tighter external monitoring, especially dividend-paying firms because they are more likely to raise external funds. Drobetz and Gruniger (2006) report a positive relationship between dividend payments and cash reserves. This follows Brav et al.'s (2005) proposition that dividend-paying firms have a higher propensity to hold cash in order to avoid the constraints of making dividend payouts to shareholders.

Jensen (1986) models the agency problems caused by excess liquidity and defines free cash flows as excess cash flows which are available after all positive net value projects are financed. The availability of free cash flows poses a dilemma to managers. Shareholders want the excess funds to be distributed as dividend payments on their investments. However, managers could use cash reserves as an opportunity to expand business for the purpose of gaining private power or to invest in negative-return projects. Thus, there is a fragile balance between optimal cash holdings for good

investments and payouts to shareholders. In this context, Jensen (1986) and Stulz (1988) propose using dividend payments to curb the overinvestment tendencies of managers of firms with free cash flow problems.

6.2.8 Debt

Myers and Majluf (1984) posit that asymmetric information makes external financing costly for firms. This pre-empts cash holding as a precaution against high transaction costs (Opler, 1999) and adverse selection costs. Because companies with accessible external financing will have lower transaction costs, debt will influence the decisions of the firms to retain cash for debt repayments. In line with this, Opler et al. (1999) suggest that firms with lower debt level prefer higher cash reserves because of less monitoring by external markets.

Risk averse managers also prefer to hold high cash level (Fama and Jensen, 1983). When managers are not fully diversified, they have the propensity to entrench themselves against market disciplinary actions. Therefore, Jensen (1983) proposes that firms with excess cash flows need to restrict the expropriation of excess funds by taking debt. The debt holdings will force managers to pay out regular debt payments to avoid bankruptcy and are an added incentive for monitoring by bondholders. The uses of debt also enable managers to manage their risk aversion by pursuing value-adding investments and avoiding excessively risky projects which will pose bankruptcy threats to firms.

6.3 Research Hypothesis

The idea of linking corporate cash holdings, corporate governance and management compensation is based on the agency cost hypothesis and the trade-off and precaution hypothesis. It is assumed that managers are aware of the benefits of cash hoarding. As Jensen (1986) posits, excess cash flows enable managers to invest in value-decreasing projects and empire-building activities. When self-serving managers use free cash flows for their private consumption, shareholders do not achieve their wealth maximisation objectives. Therefore, to align managers' with shareholders' interests in order to deploy excess cash for value-maximisation goals, managerial ownership is proposed, thereby inducing managers to seek shareholders' interests.

H1: Managerial share ownership will increase the level of cash holdings.

LTIPs offer similar incentives of share ownership. Therefore, LTIPs will increase the level of cash holdings.

H2: LTIP packages for managers will increase the level of cash holdings in a firm.

A study by Denis and Sibilkov (2009) uses share and stock options as a proxy for managerial incentive and expects a similar effect on firms' cash holdings. Elsewhere, Harford et al. (1999) report a positive association between stock options and firm cash holdings.

H3: Stock option awards will increase the level of cash holdings in a firm.

When managers have access to large surplus cash, they could be tempted to spend excessively on negative return projects or to pursue empire-building activities. From a corporate governance perspective, high cash holdings can insulate managers

from disciplinary action by capital markets and impose managerial entrenchment problems (Courdec, 2007). In this instance, corporate governance mechanisms are useful to curb excessive management spending which does not contribute to shareholders' wealth maximisation goal. Therefore, firms with strong boards will have low levels of cash hoarding because managers have less incentive to hoard cash.

H4: Board size will adversely affect the level of cash holdings because of increased monitoring.

When the proportion of insiders is high on a board, the expected efficiency of corporate governance could be diluted. Therefore, the level of cash holdings could increase when the proportion of insiders is high on a board because of slackened monitoring by the board.

H5: The level of cash holdings could be positively related to the proportion of insiders on a board.

Because board members are also incentivised to maintain close monitoring of management, when there is a conflict of interest because of the dual role of the board's chair and the CEO, the locus of control could favour a high level of cash reserves. Therefore, the dual role could affect the effective management view of cash holdings.

H6: The level of cash holdings could be high in firms with a dual CEO/chair role because of a conflict of interest.

6.4 Data Description and Methodology

For this analysis, cash holdings are defined as liquid assets required to support working capital needs as per Harford et al. (2008). Cash holdings are the ratio of cash to sales, which is computed as the log of cash and cash equivalents to total sales. Alternative measures use the cash holdings ratio calculated as the ratio of cash and marketable securities over total assets. The data for cash holdings are obtained from Datastream for 1999 to 2008 for a sample of UK FTSE 350 companies.

Gamba and Triantis (2007) analyse a model of debt financing by separating firms' borrowing and lending positions and not the net debts outstanding as a trajectory to explain debt issuance costs as a function of cash holding. The three-period model emphasises three choices of excess cash deployment: payouts to shareholders, pay outstanding debt or retain cash as reserves. Cash holdings are defined as cash and cash equivalents in firms. Another measurement, suggested by Chen et al. (2012), is to study the corporate savings rate, which is defined as the sensitivity of cash to cash flow. The authors also include free cash flow, which is defined as retained earnings minus cash payouts and capital expenditure expenses. By looking at three different measurements, this study hopes to shed light on the practice of cash holdings in UK firms.

The other data for the analysis are executive compensation and comprise the fraction of long-term incentives (shares, stock options and LTIPs) to total shares outstanding for CEOs. The study also segregates the fraction of cash compensation (salary and bonus) for CEOs in order to determine the effects on corporate cash holdings. The corporate governance variables are categorised based on the fraction of

external directors on boards, board size and total board compensation.

The corporate payout variables are defined as dividend payouts and share repurchases compared to the fraction of shares outstanding and total payouts. Because payouts will decrease the cash holdings in firms, the motives for payouts will determine the cash holding reserves in order to test the free cash flow hypothesis by Jensen (1986). Other variables which might affect cash management policies are the investment and growth of firms. To measure investment expenses, R&D and capital expenses data are used from Datastream. Prior studies by Opler et al (1999), Bates et al. (2009), Duchin (2010) and Chen et al. (2012) propose that firms with greater investment opportunities hold more cash alongside financially constrained firms because of borrowing costs.

Control variables for the study include the debt ratio, which is defined as the ratio of total liabilities to total non-cash assets. Operating cash flow is defined as cash from operations scaled by total assets. Net working capital is measured by taking the non-cash assets minus the current liabilities, scaled by non-cash assets. Because mature firms are likely to be more stable, firm age will affect the cash management policy of firms as proposed by Denis and Sibilkov (2009). Firm age is used to indicate the number of years firms have been established because young firms will be more likely to reinvest their earnings for growth compared to mature firms. Cash flow volatility is used to measure the shock of cash flows to firms. Cash flow shock is defined as the standard deviation of cash from operations across firms in the same industry. Capital expenditure is the total capital expenditure scaled by the total non-cash assets of the sample firms.

Market-to-book ratio is also included as a control variable. The ratio is defined as the ratio of the market value to the book value of equity. Dividend yield and total payout

variables are used as proxies for payout. Total debt is classified as total debt scaled by total non-cash assets. For comparison, the study also includes total debt over total assets. Further, the debt is split into short-term and long-term debts, both of which are scaled by non-cash and total assets.

The data were analysed using statistics data analysis (STATA) 11. Both univariate (i.e. pairwise correlations) and multivariate analysis are used. Multivariate analysis based on OLS regression is mainly employed to test the research hypotheses. As part of the robustness check, fixed effect regressions are used. These are employed to capture the heterogeneity across samples which could be ignored in pooled OLS. Therefore, the analysis is more robust against any misspecification of omitted variables.

The following regression model is used for four measures of cash holding proxies: cash to total non-cash assets, cash to sales, cash to market value and log of cash.

$$CASH_{it} = CEO\_SHARE_{it} + CEO\_OPTION_{it} + CEO\_LTIP_{it} + DY_{it} + TOTAL\_PAYOUT_{it} + CFINVEST_{it} + FCF_{it} + MTB_{it} + DEBT_{it} + INVEST_{it} + FIRM\_AGE_{it} + SIZE_{it} + RISK_{it} + LOG\_BOARD_{it} + FRACTIONEXD_{it} + CEO\_DUALITY_{it} + \mathcal{E}_{it}$$

Where:

CEO_SHARE_{it} = CEO share ownership for firm i at time t

CEO_OPTION_{it} = CEO share options holding for firm i at time t

CEO_LTIP_{it} = CEO LTIPs holding for firm i at time t

DY_{it} = Dividend yield for firm i at time t

$TOTAL\_PAYOUT_{it}$ = Total payouts for firm i at time t

$CFINVEST_{it}$ = Cash flows from investment for firm i at time t

FCF_{it} = Free cash flows for firm i at time t

MTB_{it} = Market to book ratio for firm i at time t

$DEBT_{it}$ = Ratio of total liabilities to total non-cash assets for firm i at time t

$INVEST_{it}$ = Ratio of capital expenditure to total non-cash assets for firm i at time t

$FIRM\_AGE_{it}$ = Firm age for firm i at time t

$SIZE_{it}$ = Firm size for firm i at time t

$RISK_{it}$ = Volatility of cash of firms for firm i at time t

LOG_BOARD_{it} = Log of board size for firm i at time t

$FRACTIONEXD_{it}$ = Fraction of non-executive directors on board for firm i at time t

$CEO\_DUALITY_{it}$ = CEO duality role dummy for firm i at time t

ε_{it} = Error term

6.5 Results

6.5.1 Descriptive Statistics

Table 6.2 presents descriptive statistics for the variables used in this study. The average value of cash holdings is log of 18.41 or £99.5 million. The average values for cash-to-asset ratio and cash-to-sales ratio are 9% (median 5.6%) and 23% (median 7.7%) respectively which is similar with average cash ratio of 9.9% (median 5.9%) reported by Ozkan and Ozkan (2004) for UK firms. Meanwhile, the mean for the cash-to-market value ratio is 15%, which is higher than the 14% for the cash-to-asset ratio

reported by Kyojik and Lee (2012) for Asian firms. All cash ratios (cash to assets, cash to sales and cash to market value) have positive skewness which means that average (mean) of the cash ratios are higher than the median. Only log of cash shows negative skewness whereby the mean is lower than the median of the data. The sample shows an average value for short term debt and long term debt as £64.7 million and £1.29 billion respectively. The average CEO ownership is 0.76% (median 0.0359%) whiles the average LTIPS is 0.12% (median 0.06%) and mean of stock options is 0.78% (median 0.0356%). The average dividend yield is 3.4% while the total payout is 5.0%. The proportion of non-executive director is about half or 0.56 while the average board size is 9 members. The CEO and Chairman duality role for the sample is 101 firm years or only for 26 firms from sample size of 183 firms. There is only 14.2% of firms with dual CEO/Chairman role compared to 72 firms or 8.6% from 839 UK firms from year 1995 to 1999 as reported by Ozkan and Ozkan (2004). This ensures less conflict of interest for UK firms after the implementation of the Greenbury report which limits the duality role of CEO and Chairman. The average market to book value is 2.26 while average free cash flow is 17% of total noncash assets. Finally, the average investment is19% of total noncash assets and average firm size is £1.14 billion respectively.

Table 6.3 presents the Pearson Correlation among the variables in this analysis. The proxy for cash holding, cash-to-asset ratio is positively and strongly related to short debt, free cash flow, volatility and fraction of non-executive director but negatively correlated with firm size, , dividend yield, total payout, payout dummy and CEO duality. LTIPs is defined as the proportion of LTIPS to total share outsanding and is positively related to free cash flow, investment and CEO duality but negatively correlated with

short debt and firm size. Furthermore, fraction of non-executive is positively and strongly correlated with the entire cash holdings variable. Meanwhile, logboardsize is positively and significantly related to log cash. Total market debt is also significantly and negatively related to cash-to-asset, cash-to-market value ratio and log cash. However, investment shows the expected negative signs with inverse relationship to the cash holdings proxy (cash to assets, cash to market value and log of cash).

Table 6.1: Description of variables

cashasset	Cash and cash equivalents scaled by non-cash assets
cashsales	Cash and cash equivalents scaled by sales
cashmv	Cash and cash equivalents scaled by market value
logcash	Log of cash to non-cash assets
FCF	Operating cash flow scaled by non-cash assets
cashvol	Volatility of cash of firms
invest	Capital expenditure scaled by non-cash assets
debt	Ratio of total liabilities to total non-cash assets
age	Number of years
M2B	Ratio of market-to-book value of equity
dy	Dividend yield
tp	Total payout
totaldebt	Total liabilities to total non-cash assets
share	Managerial share ownership to total non-cash assets
LTIPs	Managerial LTIPs portfolio to total non-cash assets
fractionnex	Fraction of non-executive directors to board size
logbsize	Log board size
duality	CEO and chairman duality dummy
shortdebt	Short-term debt scaled by non-cash assets
longdebt	Long-term debt scaled by non-cash assets

Table 6.2: Descriptive statistics for variables

Variable	Obs.	Mean	Median	Std. Dev.	Min.	Max.	Skewness
Cash holdings (DV)							
cash to asset	1674	0.090214	0.055529	0.105294	0	0.76015	2.428208
cash to sales	1674	0.227759	0.076633	0.601413	0	9.208414	7.937761
cash to market value	1646	0.155213	0.075623	0.470243	0	1.247818	25.28568
log cash	1649	18.41516	18.3824	2.244354	0	22.72248	-2.314802
CEO compensation variables							
share	1309	0.007585	0.000359	0.032542	0	0.329996	6.533791
s_option	1309	0.010681	0.003564	0.028458	0	0.373311	7.609758
LTIPs	1300	0.012456	0.006011	0.035912	0	0.1583	3.724572
Corporate governance variables							
log board size	1674	0.9779	0.778	0.1108	0.6021	1.3617	0.0900102
fraction of non-executive	1674	0.5631	0.559028	0.129	0	0.9167	-0.288879
CEO duality	1674	0.9261	0.5	0.2617	0	1	0.0650034
Control variables							
FCF	1674	0.17424	0.108617	0.505364	-0.38921	1.833529	8.819212
cashvol	1674	0.020923	0.018399	0.010462	0.007885	0.060891	2.445132
invest	1674	0.193805	0.053054	0.552082	0	3.232203	7.344446
age	1674	97.23	122.91	47.808	8	195	11.82707
M2B	1641	3.9091	2.06	9.9631	0.03	194.86	-11.93343
dy	1674	0.034077	0.0296	0.042946	0	0.1321	13.18493
tp	1674	0.050021	0.0345	0.082303	0	0.30162	8.725932
totaldebt	1674	0.249231	0.194789	0.232714	0	0.999616	1.364199
shortdebt	1672	0.056429	0.033306	0.076231	0	0.334183	3.863854
longdebt	1672	0.620939	0.598876	0.237813	0.135594	1.362572	1.492408

Table 6.3: Pearson correlation table

	cashasset	cashsales	cashmv	logcash	firmage	m2b	own1	ltips	s_options	shortdebt	longdebt	industry	size	fcf	vol	invest	mktdebt	payout~m	dy	tp
cashasset	1																			
cashsales	0.4635*	1																		
cashmv	0.2381*	0.2041*	1																	
logcash	0.2984*	0.1656*	0.2027*	1																
firmage	-0.0023	-0.0364	0.031	0.0849*	1															
m2b	0.0182	0.0061	-0.0092	0.001	0.002	1														
own1	0.039	-0.0134	-0.0143	-0.0314	-0.2042*	0.0077	1													
ltips	-0.0753	0.0845	0.0413	-0.0755	-0.0516	0.0065	-0.0396	1												
s_options	0.0165	-0.0063	0.0107	-0.0279	0.0315	0.0014	-0.0226	0.4427*	1											
shortdebt	0.1012*	0.0128	0.0500*	0.0569*	0.1950*	-0.0139	-0.0264	-0.1667*	-0.0454	1										
longdebt	0.0291	0.0136	-0.0332	0.0186	0.1016*	-0.0517*	-0.0081	0.0371	0.0099	0.3838*	1									
industry	-0.0337	0.1924*	0.0493*	0.0159	0.0039	-0.0041	0.0757*	0.0911*	0.0173	-0.1136*	-0.0504*	1								
size	-0.0847*	-0.2587*	0.0631*	0.5343*	0.1690*	-0.0215	-0.0480*	-0.1624*	-0.0804*	0.0480*	0.0755*	-0.1398*	1							
fcf	0.0410*	0.2700*	0.0026	0.0262	-0.0528*	0.0166	-0.0148	0.1647*	0.0244	-0.0014	0.0023	0.0836*	-0.3434*	1						
vol	0.1156*	0.018	0.2983*	0.0283	0.0213	0.0151	0.0082	0.0811	0.0740*	0.0464*	-0.0273	0.0174	0.0263	-0.0097	1					
invest	-0.0439*	0.2129*	-0.0334	-0.0685*	-0.0745*	-0.0088	-0.0328	0.1584*	0.0453	0.0191	-0.0904*	0.2048*	-0.3297*	0.1116*	-0.0782*	1				
mktdebt	-0.3072*	-0.0352	0.1686*	-0.0763*	-0.0279	-0.009	-0.0728*	0.0473	-0.006	-0.0635*	0.0404	0.2582*	-0.0729*	0.1915*	0.1456*	0.1135*	1			
payout_dum	-0.2525*	-0.1697*	-0.0625*	-0.0439*	0.0222	-0.0243	0.026	-0.0004	-0.0748*	0.0018	-0.029	0.0141	0.0964*	0.0111	-0.2918*	-0.0538*	0.0193	1		
dy	-0.1083*	-0.0491*	0.4402*	0.0163	0.0231	-0.0271	0.0026	0.0331	-0.0122	-0.0082	0.0077	0.0322	0.0833*	-0.0707*	0.2757*	-0.0489*	0.2256*	0.2273*	1	
tp	-0.0328	-0.0184	0.2721*	0.0483*	0.0125	-0.0377	0.0116	0.0001	0.0962*	-0.0131	0.0264	0.0367	0.0773*	-0.0494*	0.1916*	-0.0207	0.2090*	0.0911*	0.5784*	1

6.6 Empirical Results

6.6.1 Univariate Statistics

Table 6.4 shows the univariate test cash holdings and firm characteristics. For the cash-to-asset ratio, the short debt, firm volatility and fraction of non-executive directors are positively and significantly impact the cash-to-asset ratio. Other corporate governance variable, CEO duality shows a negative and significant relationship with cash-to-asset ratio. . However, the market debt has negatively and significantly impact the cash-to-asset ratio as opposed the short debt. This shows that firm with high cash has low level of total debt as opposed to short term debt only.

For cash-to-sales ratio in Table 6.5, the CEO ownership and share options shows negative but weak association with the cash ratio. Conversely, LTIPs show weak but positive effects on the cash to sales ratio. The lack of significant results for main CEO equity variables shows that CEO equity incentives have little influence on cash to sales ratio. Meanwhile, investment reports a positive and significant relationship at 5% significance level. This support the hypothesis that firms with excess cash will increase their investments. However, the size shows the negative signs to signify that large firms prefer to hold low cash levels. Dividend yield is also negatively impact the cash-to-sales ratio in firms. Only fraction of non-executive directors positively influences the cash-to-sales ratio of the firm compares to other corporate governance attributes.

Table 6.4: OLS regression for cash to asset ratio.

This table presents the OLS regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of OLS regression for cash to asset ratio (cash and cash equivalents scaled by non-cash assets). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
cash to asset														
own1	0.132													
	(0.093)													
ltips		-0.314												
		(0.228)												
s_options			0.052											
			(0.109)											
shortdebt/asset				0.146**										
				(0.037)										
longdebt/asset					0.013									
					(0.011)									
size						-0.005**								
						(0.001)								
vol							1.157**							
							(0.244)							
invest								-0.008+						
								(0.005)						
mktdebt/asset									-0.139**					
									(0.011)					
tp										-0.041				
										(0.030)				
dy											-0.259**			
											(0.058)			
fractionnex												0.090**		
												(0.023)		
logbsize													-0.012	
													(0.012)	
duality														-0.032**
														(0.011)

Constant	0.091**	0.078**	0.077**	0.082**	0.082**	0.199**	0.066**	0.092**	0.125**	0.092**	0.099**	0.042**	0.120**	0.122**
	(0.003)	(0.005)	(0.003)	(0.003)	(0.007)	(0.031)	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)	(0.013)	(0.027)	(0.011)
Observations	1,308	1008	1026	1,522	1,570	1,672	1,662	1,673	1,670	1,670	1,671	1,349	1,349	1,352
R-squared	0.002	0.006	0.000	0.010	0.001	0.007	0.013	0.002	0.094	0.001	0.012	0.011	0.001	0.006

Table 6.5: OLS regression for cash to sales ratio.
This table presents the OLS regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of OLS regression for cash to sales ratio (cash and cash equivalents scaled by sales). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
cash to sales														
own1	-0.275													
	(0.569)													
ltips		1.173												
		(0.758)												
s_options			-0.099											
			(0.545)											
shortdebt/asset				0.095										
				(0.191)										
longdebt/asset					0.032									
					(0.060)									
size						-0.091**								
						(0.008)								
vol							1.039							
							(1.419)							
invest								0.233**						
								(0.026)						
mktdebt/asset									-0.091					
									(0.063)					
tp										-0.131				
										(0.174)				
dy											-0.675*			
											(0.336)			
fractionnex												0.530**		
												(0.130)		
logbsize													0.069	
													(0.066)	
duality														-0.052
														(0.069)

Constant	0.255**	0.132**	0.189**	0.212**	0.202**	2.117**	0.208**	0.184**	0.251**	0.236**	0.253**	-0.056	0.087	0.297**
	(0.019)	(0.016)	(0.017)	(0.018)	(0.040)	(0.173)	(0.033)	(0.015)	(0.022)	(0.017)	(0.019)	(0.075)	(0.149)	(0.067)
Observations	1,308	1008	1026	1,522	1,570	1,672	1,662	1,673	1,670	1,670	1,671	1,349	1,349	1,352
R-squared	0.000	0.007	0.000	0.000	0.000	0.067	0.000	0.045	0.001	0.000	0.002	0.012	0.001	0.000

Table 6.6: OLS regression for cash to market value

This table presents the OLS regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of OLS regression for cash to market value ratio (cash and cash equivalents scaled by firm's market value). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
cash to market value														
own1	-0.228													
	(0.446)													
ltips		0.650												
		(0.869)												
s_options			0.087											
			(0.285)											
shortdebtasset				0.163+										
				(0.084)										
longdebtasset					-0.037									
					(0.028)									
size						0.017*								
						(0.007)								
vol							13.682**							
							(1.082)							
invest								-0.029						
								(0.022)						
mktdebt									0.364**					
									(0.053)					
tp										1.504**				
										(0.131)				
dy											4.682**			
											(0.236)			
fractionnex												0.473**		
												(0.109)		
logbsize													0.046	
													(0.056)	

duality														0.068
														(0.054)
Constant	0.160**	0.126**	0.130**	0.133**	0.167**	-0.207	-0.130**	0.161**	0.069**	0.077**	-0.009	-0.108+	0.055	0.095+
	(0.015)	(0.018)	(0.009)	(0.008)	(0.019)	(0.143)	(0.025)	(0.012)	(0.017)	(0.013)	(0.013)	(0.063)	(0.126)	(0.052)
Observations	1,308	1008	1026	1,522	1,570	1,672	1,662	1,673	1,670	1,670	1,671	1,349	1,349	1,352
R-squared	0.000	0.002	0.000	0.003	0.001	0.004	0.089	0.001	0.028	0.074	0.194	0.014	0.001	0.001

Table 6.7: OLS regression for log of cash.

This table presents the OLS regressions for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients of OLS regression for cash log of cash (natural logarithm of cash and cash equivalent). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
log of cash														
own1	-1.996													
	(1.775)													
ltips		-7.764												
		(5.669)												
s_options			-1.781											
			(2.236)											
shortdebtasset				1.478*										
				(0.670)										
longdebtasset					0.165									
					(0.227)									
size						0.703**								
						(0.027)								
vol							6.217							
							(5.436)							
invest								-0.292**						
								(0.105)						
mktdebt									-0.755**					
									(0.244)					
tp										1.274+				
										(0.652)				
dy											0.828			
											(1.255)			
fractionnex												3.501**		
												(0.483)		
logbsize													2.415**	
													(0.241)	
duality														0.222
														(0.241)

Constant	18.308**	19.034**	18.418**	18.411**	18.334**	3.714**	18.296**	18.449**	18.581**	18.355**	18.394**	16.309**	12.845**	18.080**
	(0.060)	(0.119)	(0.069)	(0.062)	(0.152)	(0.576)	(0.127)	(0.058)	(0.081)	(0.065)	(0.071)	(0.279)	(0.546)	(0.231)
Observations	1,308	1008	1026	1,522	1,570	1,672	1,662	1,673	1,670	1,670	1,671	1,349	1,349	1,352
R-squared	0.001	0.006	0.001	0.003	0.000	0.285	0.001	0.005	0.006	0.002	0.000	0.038	0.071	0.001

Meanwhile, Table 6.6 depicts the univariate results for cash-to-market value ratio. None of the CEO equity variables provide significant effects on cash to market value ratio. Furthermore, market debt, volatility and payouts variable are all positively associated with cash holdings. Again, fraction of non-executive directors positively influences the cash-to-market value ratio in this univariate analysis. In Table 6.7, same insignificant results are presented for CEO equity incentives effects on log of cash. However, for corporate governance variables, both fraction of non-executive directors and log of board size show positive and significant relationship with log of cash holdings. This implies that corporate governance has positive influence on level of cash holdings of a firm. Other control variables (investment and market debt) show negative and significant influence on log of cash. Firms with high investment and high debt will have lower cash holdings as firms utilize cash for investment.

As the univariate test do not provide the significant results for cash ratios and log of cash, the second part of analysis examine the mean t-test for cash ratios and log of cash. Table 6.8 to 6.11 reports the univariate mean-comparison tests of the subgroups of firms categorized on the basis of above and below median values for specific firms' characteristics. The t-test is used to analyse the hypothesis that firms with above values differ with firms with low median values with respect to the cash ratios and log of cash. In Table 6.8, it shows that CEO ownership is 0.61% for firms with below median cash to asset rato and 0.91% for firms with above median cash to asset ratio. The differences are statistically significant at 10% significance level. This means that firms with high cash to asset ratio have higher CEO ownership. This concurs with Ozkan and Ozkan (2004) findings that high level of managerial ownership increases managerial incentives to hold

Table 6.8: Mean comparison of cash constrained firms for cash to assets

This table presents the mean comparison for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports mean comparison for cash constrained firms for cash to assets (cash and cash equivalent to total assets). The sub-samples are for cash to asset below median (50%) as cash constrained firms and above median as cash rich firms.

	Cashasset below	Cashasset above	t-test
cashasset	median	median	
own1	0.0061	0.0091	**-1.6892**
	0.0011	0.0014	**0.0914**
ltips	.012805	.01214	**0.3553**
	0.0681	0.0743	**0.7226**
S_options	.0098662	.0115179	**-0.8743**
	.0011866	.0014767	**0.3822**
shortdebtasset	0.0449	0.0665	**-5.7773**
	0.0020	0.0030	**0.0000**
longdebtasset	0.6104	0.6302	**-1.7122**
	0.0075	0.0086	**0.0870**
size	20.8747	20.8329	0.4957
	0.0614	0.0577	0.6202
m2b	2.3288	2.1933	0.1305
	0.3743	0.9457	0.8962
firmage	0.1399	0.2084	**-2.7813**
	0.0096	0.0227	**0.0055**
fcf	0.0201	0.0217	**-3.1322**
	0.0004	0.0004	**0.0018**
vol	0.2520	0.1359	**4.3255**
	0.0243	0.0115	**0.0000**
invest	0.3118	0.1870	**11.3719**
	0.0082	0.0073	**0.0000**
mktdebt	0.0542	0.0464	**1.9882**
	0.0030	0.0026	**0.0469**
tp	0.0382	0.0304	**3.8566**
	0.0017	0.0012	**0.0001**
dy	0.5573	0.5692	**-1.7050**
	0.0046	0.0052	**0.0884**
fractionnex	0.9414	0.9117	**2.0981**
	0.0091	0.0107	**0.0361**
logbsize	0.9570	0.8956	**4.9323**
	0.0070	0.0099	**0.0000**
duality	2.2598	2.2454	1.0391
	0.0099	0.0096	0.2989

Table 6.9: Mean comparison of cash constrained firms for cash to sales

This table presents the mean comparison for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports mean comparison for cash constrained firms for cash to sales (cash and cash equivalent to total sales). The sub-samples are for cash to sales < median (50%) as cash constrained firms and above median as cash rich firms.

	Cashsales below	Cashsales above	t-test
cashsales	median	median	
own1	0.0070	0.0081	-0.6052
	0.0012	0.0013	0.5452
ltips	.0123182	.012592	-0.1465
	.0012505	.001388	0.8836
S_options	.0097282	.0116857	-1.0360
	.0011284	.0015324	0.3005
shortdebtasset	0.0547	0.0579	-0.8435
	0.0024	0.0029	0.3991
longdebtasset	0.6253	0.6171	0.7079
	0.0087	0.0078	0.4791
size	21.0864	20.6238	**5.5397**
	0.0508	0.0661	**0.0000**
m2b	1.8307	2.6719	-0.8109
	0.8118	0.6520	0.4176
firmage	0.1025	0.2452	**-5.8375**
	0.0044	0.0239	**0.0000**
fcf	0.0208	0.0211	-0.6022
	0.0004	0.0004	0.5471
vol	0.1116	0.2751	**-6.1281**
	0.0114	0.0240	**0.0000**
invest	0.2568	0.2418	1.3187
	0.0082	0.0079	0.1874
mktdebt	0.0529	0.0476	1.3681
	0.0030	0.0025	0.1715
tp	0.0375	0.0312	**3.1085**
	0.0017	0.0012	**0.0019**
dy	0.5481	0.5777	**-4.2744**
	0.0050	0.0048	**0.0000**
fractionnex	0.9438	0.9097	**2.4071**
	0.0090	0.0108	**0.0162**
logbsize	0.9675	0.8868	**6.5182**
	0.0061	0.0102	**0.0000**
duality	2.2295	2.2737	**-3.2062**
	0.0096	0.0098	**0.0014**

large cash reserves as managerial perquisites increases. Other results indicate that fraction of non executive directors is lower for firms with high cash to asset ratio whereas the board size is larger in firms with lower cash to asset ratio.

For Table 6.9, the differences are not significant for CEO equity incentives (shareholding, LTIPs and stock options) between low and high median values for cash to sales ratio. However, all 3 corporate governance variables show statistically significant differences where both fraction of non-executive directors and board size is lower for firms with high cash to sales ratio (significant at 5% and 1% significance level respectively) while CEO duality role is higher for firms with high cash to sales ratio (statistically significant at 5% significance level).

Table 6.10 shows the results for the mean t-test for low and high median value for cash to market value ratio. For share options, the average CEO stock options for firms with lower median value of cash to market value ratio is 0.79% while the higher median value firms show average CEO stock options is 1.3%. The differences are statistically significant at 5% significance level. This indicates that CEOs with firms with high cash to market value ratio have higher stock options level than firms with lower cash to market value ratio. The corporate governance variables show similar results with cash to sales ratio.

Table 6.11 reports the mean-comparison test results of the subsample categorized based on above and below median values for natural log of cash holdings. None of the CEO equity comparison has significant differences between the high and low median value for log of cash holdings. Meanwhile, the fraction of non-executive director shows

Table 6.10: Mean comparison of cash constrained firms for cash to market value

This table presents the mean comparison for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports mean comparison for cash constrained firms for cash to market value (cash and cash equivalent to market value). The sub-samples are for cash to market value below median (50%) as cash constrained firms and above median as cash rich firms.

	Cashmv below	Cashmv above	t-test
cashmv	median	median	
own1	0.0069	0.0083	-0.7394
	0.0012	0.0014	0.4598
ltips	.0118682	.0130501	-0.6326
	.0014346	.001194	0.5274
S_options	.0079783	.0131232	**-2.7300**
	.0009537	.0015705	**0.0065**
shortdebtasset	0.0526	0.0598	**-1.9092**
	0.0024	0.0029	**0.0564**
longdebtasset	0.6182	0.6233	-0.4427
	0.0077	0.0085	0.6580
size	20.6484	21.0475	**-4.7660**
	0.0562	0.0617	**0.0000**
m2b	2.2610	2.2576	0.0033
	0.9562	0.4585	0.9974
firmage	0.1641	0.1838	-0.7991
	0.0123	0.0210	0.4243
fcf	0.0196	0.0222	**-5.1388**
	0.0003	0.0004	**0.0000**
vol	0.2168	0.1722	**1.6536**
	0.0220	0.0159	**0.0984**
invest	0.2173	0.2795	**-5.5084**
	0.0070	0.0087	**0.0000**
mktdebt	0.0420	0.0568	**-3.8097**
	0.0018	0.0032	**0.0001**
tp	0.0319	0.0360	**-2.0148**
	0.0015	0.0014	**0.0441**
dy	0.5468	0.5795	**-4.7268**
	0.0051	0.0047	**0.0000**
fractionnex	0.9137	0.9381	**-1.7275**
	0.0108	0.0091	**0.0843**
logbsize	0.9611	0.8930	**5.4760**
	0.0067	0.0099	**0.0000**
duality	2.2398	2.2645	**-1.7883**
	0.0094	0.0100	**0.0739**

Table 6.11: Mean comparison of cash constrained firms for cash to log of cash

This table presents the mean comparison for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports mean comparison for cash constrained firms for log of cash (natural logarithm of cash and cash equivalent). The sub-samples are for log of cash below median (50%) as cash constrained firms and above median as cash rich firms.

	logcash below	logcash above	t-test
logcash	median	median	
own1	0.0070	0.0083	-0.7303
	0.0011	0.0015	0.4653
ltips	.0157958	.0104755	**2.7810**
	.0019538	.0009108	**0.0057**
S_options	.0117614	.0097554	1.0590
	.0013473	.0013199	0.2899
shortdebtasset	0.0534	0.0590	-1.5006
	0.0025	0.0028	0.1337
longdebtasset	0.6213	0.6206	0.0572
	0.0088	0.0077	0.9544
size	20.0797	21.6040	**-20.1679**
	0.0421	0.0623	**0.0000**
m2b	2.7253	1.8331	0.8594
	0.5749	0.8421	0.3903
firmage	0.1435	0.2040	**-2.4493**
	0.0121	0.0213	**0.0144**
fcf	0.0207	0.0211	-0.9115
	0.0004	0.0004	0.3621
vol	0.2135	0.1748	1.4351
	0.0225	0.0151	0.1515
invest	0.2373	0.2608	**-2.0579**
	0.0081	0.0080	**0.0398**
mktdebt	0.0498	0.0502	**-0.1225**
	0.0030	0.0025	**0.9025**
tp	0.0352	0.0331	1.0371
	0.0017	0.0012	0.2998
dy	0.5416	0.5857	**-6.4134**
	0.0046	0.0051	**0.0000**
fractionnex	2.1789	2.3272	**-11.2203**
	0.0089	0.0098	**0.0000**
logbsize	0.9173	0.9351	-1.2600
	0.0105	0.0095	0.2079
duality	0.9300	0.9195	0.8370
	0.0089	0.0087	0.4027

statistically significant difference at 1% significance level where the mean is higher for firms above the median value of log of cash holdings. Other variable such as firm size has statistically significant differences where larger firms have high median value of cash holdings. Overall results show that CEO ownership and stock options incentives have influence on the cash ratios.

6.6.2 Multivariate Analysis

This section presents the results from panel data regression analysis. The proxies for cash holdings are regressed against a set of explanatory and control variables. The objective for the regression is to test the model on determinants of cash holdings by including the extent of debt maturity, equity compensation and corporate governance mechanism influence the cash holdings in UK firms. OLS results using different ratios for cash are presented in Panels A of Tables 6.12, 6.13, 6.14 and 6.15. Fixed effects regression is also used to control for the heterogeneity of the unobserved firms in the sample and are presented in Panels B. The results of these estimations are discussed below in details.

For cash-to-asset, the results in the Table 6.12 show that CEO ownership has positive and significant relationship with the cash to asset ratio. Ozkan and Ozkan (2004) note that when managerial ownership is high, managers have incentive to hold a large cash reserves in the firm. Opler (1999) explains that precautionary motive of cash holdings increases for firms with high agency conflict or having difficulties in raising

Table 6.12: Pooled OLS and fixed effect regression for cash to assets

This table presents the OLS regression (Panel A) and fixed effects regression (Panel B) for cash to assets for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients for cash to assets (cash and cash equivalent scaled by non-cash assets). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	Panel A - OLS regression						Panel B - fixed effects regression					
cash/asset	year dummy			year and industry dummy			year dummy			year and industry dummy		
firmage	-0.004**	-0.001	0.007**	0.006*	0.003**	0.008**	-0.003	0.004	0.008**	0.010*	0.003	0.013**
	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.005)	(0.003)	(0.005)	(0.002)	(0.005)
m2b	-0.020	-0.024+	-0.022+	-0.013	-0.017+	-0.015	-0.021+	-0.025+	-0.020	-0.016+	-0.017+	-0.014
	(0.013)	(0.013)	(0.013)	(0.009)	(0.010)	(0.010)	(0.013)	(0.013)	(0.012)	(0.009)	(0.010)	(0.010)
own1	0.162+	0.210*	0.071	0.172+	-0.038	0.048	0.094	0.127	0.110	0.169+	0.020	0.081
	(0.088)	(0.087)	(0.091)	(0.090)	(0.089)	(0.089)	(0.098)	(0.098)	(0.103)	(0.103)	(0.103)	(0.103)
ltips	-0.138	-0.154	-0.349	-0.342	-0.319	-0.237	-0.173	-0.223	-0.267	-0.282	-0.276	-0.262
	(0.272)	(0.275)	(0.277)	(0.273)	(0.266)	(0.263)	(0.244)	(0.238)	(0.253)	(0.244)	(0.253)	(0.243)
s_options	-0.507+	-0.711*	-0.657**	-0.802**	-0.540*	-0.661**	-0.571*	-0.618*	-0.548*	-0.656**	-0.380	-0.477*
	(0.280)	(0.281)	(0.224)	(0.215)	(0.220)	(0.220)	(0.256)	(0.254)	(0.230)	(0.228)	(0.234)	(0.234)
shortdebt	-0.009**	-0.009**					-0.007**	-0.007**				
	(0.002)	(0.002)					(0.002)	(0.002)				
size	0.004	0.001	0.026**	0.036**	-0.009**	-0.010**	-0.007	-0.007	0.024**	0.027**	-0.012**	-0.011**
	(0.003)	(0.003)	(0.004)	(0.005)	(0.002)	(0.002)	(0.004)	(0.004)	(0.006)	(0.007)	(0.004)	(0.004)
fcf	0.013	0.005	0.020*	0.017*	0.013+	0.013+	0.038*	0.034*	0.028**	0.030**	0.027**	0.030**
	(0.018)	(0.018)	(0.008)	(0.008)	(0.008)	(0.008)	(0.016)	(0.015)	(0.007)	(0.007)	(0.007)	(0.007)
vol	1.373**	0.692*	1.964**	1.273**	2.535**	1.805**	0.168	-0.352	0.643*	0.117	1.099**	0.495+
	(0.357)	(0.325)	(0.338)	(0.311)	(0.328)	(0.311)	(0.332)	(0.286)	(0.316)	(0.281)	(0.324)	(0.292)
invest	0.006	0.002	0.010	0.007	0.005	0.002	0.023**	0.022**	0.022**	0.021**	0.015*	0.014+
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
dy	-0.339**	-0.320**	-0.361**	-0.316**	-0.112	-0.111	-0.057	-0.033	-0.077	-0.054	0.073	0.086
	(0.095)	(0.093)	(0.096)	(0.094)	(0.096)	(0.095)	(0.078)	(0.076)	(0.080)	(0.080)	(0.085)	(0.084)
tp	0.060	0.077+	0.033	0.066	0.068	0.091*	0.030	0.038	0.014	0.032	0.026	0.040
	(0.045)	(0.044)	(0.046)	(0.044)	(0.045)	(0.044)	(0.035)	(0.035)	(0.037)	(0.037)	(0.037)	(0.037)
logbsize	0.017	0.006	0.051**	0.027*	0.027*	0.015	-0.018	-0.020	-0.024	-0.032*	-0.031*	-0.036*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
fractionnex	0.046+	0.080**	0.085**	0.130**	0.062*	0.117**	0.006	0.044+	0.027	0.086**	0.022	0.078**
	(0.026)	(0.024)	(0.026)	(0.024)	(0.025)	(0.024)	(0.028)	(0.026)	(0.029)	(0.026)	(0.029)	(0.026)
duality	0.003	-0.004	-0.031*	-0.033*	-0.036**	-0.038**	0.005	0.005	-0.038**	-0.033*	-0.039**	-0.034*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
longdebt			-0.040**	-0.050**					-0.043**	-0.042**		
			(0.003)	(0.004)					(0.005)	(0.005)		
mktdebt					-0.230**	-0.213**					-0.172**	-0.147**
					(0.015)	(0.016)					(0.021)	(0.021)
Constant	0.094+	0.161**	0.166**	0.225**	0.185**	0.200**	0.386**	0.371**	0.482**	0.418**	0.412**	0.358**

	(0.051)	(0.054)	(0.049)	(0.052)	(0.047)	(0.051)	(0.083)	(0.087)	(0.080)	(0.082)	(0.077)	(0.081)
Observations	1,123	1,123	1,219	1,219	1,219	1,219	1,123	1,123	1,219	1,219	1,219	1,219
R-squared	0.080	0.121	0.179	0.229	0.228	0.249	0.175	0.191	0.281	0.340	0.300	0.307

external capital. However, the level of CEO stock options holdings is negatively related to the cash ratio. This may be attributed to the risk taking incentive in stock options to induce managers to be more aggressive and hold less cash reserves.

Furthermore, the firm size, short term debt, long term debt and total market debt shows negative and significant results. The results regarding debts are consistent with the prediction on the inverse relationship between cash holdings and debts which is consistent with financing hierarchy that firms use internal cash reserves when the debt is costly. These support the results by Opler et. al. (1999) which suggests that cash holding is advantageous when other variables increase the cost of external financing. As the negative coefficient is insignificantly different from negative one, the firms in the sample are indifferent from having extra debt as oppose to extra cash as implied by Opler et. al. (1999).

Meanwhile, free cash flow, volatility and investment opportunities all have positive and significant relationship with cash-to-asset ratio. This support the hypothesis that firms invest more when there are more internal funds and utilization of free cash flow to increase investment as posit by Bates et. al. (2009) while volatility increase managerial discretion to hold cash against future financial distress (Ozkan and Ozkan, 2004; Bao et. al., 2012). In particular, the coefficients of the variables which increase cash holdings are also variable that constraint debts. However, the negative association at 5% significance level with dividend yield show that cash-to asset ratio is decreasing with the dividend paid to shareholders. Corporate governance attributes results indicate that board size and fraction of non-executive directors increase the cash holdings ratio. This support the notion that corporate governance mechanism will increase the control

mechanism in how the firms utilize excess cash in form of dividend payouts and investments.

For fixed effect regression in Panel B of Table 6.12, most of the results holds. There are only weak association between CEO ownership and cash-to-asset ratio. The sign and strength for stock options is maintained for the fixed effects. The coefficients for short debt, long term debt and total market value of debt are -0.007, -0.043 and -0.172 respectively and significant1% significance level. These indicate that if short term debt, long term debt andtotal market value of debt decrease by 1%, cash-to-asset ratio will increase by 0.007, 0.043 and 0.172 respectively. This is consistent with Opler et. al. (1999) intuit that firms with low debt hold more cash due to less monitoring by capital market. For corporate governance variables, only fraction of non-executive directors holds positive and significant impact on cash-to-asset ratio. As the significance results diminishes for log of board size, it seems that fraction of-non-executive directors on board is use to create the control mechanism to positively influence the cash holding policy in UK firms. The CEO duality has results are both negative and significance in both the OLS and fixed effects regressions to imply the notable consequence of firms having CEO with dual roles will negatively impact the financial policy of the firms in the sample. The firm size maintains the negative signs for fixed effects regression. The results imply that larger firms hold lower cash because the excess cash is used for investments. Free cash flow and firm volatility remains positive and significance showing that when free cash flow and volatility increase by 1%, the cash-to-asset ratio will increase by 0.03 and 1.099 respectively. As free cash flow increase, cash holdings increase while firms retain more cash when there is high volatility in share price in

anticipation of future cash flow shock for the firm.

For other control variables, dividend yield and total payout has little impact on cash-to-asset ratio. This situation may arise when there is significant increase in investment or long term debt, the firm payout has little impact on cash-to-asset ratio of the firm. Finally, CEO ownership and LTIPs fails to have significant effect on cash-to-asset ratio in fixed effects regression.

Panel A of Table 6.13 shows OLS regression results for cash-to-sales ratio. Similar with cash-to-asset ratio, the coefficients show negative and significant results for both short term debt and total market value of debt. The results are statistically significant at 1% significance level (total debt) and 5% significance level (short term debt) The coefficients of -0.02 for short term debt and -0.508 for total market value of debt indicate that for every 1% increase of these debts, the cash-to-sales ratio will decrease by 0.02 and 0.51 point respectively. This supports the hypothesis that availability of debt financing reduces the needs for high cash holdings and similar with findings by Bates et. al. (2009).

The sign of long term debt is sensitive to whether the dependent variable is cash-to-asset ratio or cash-to-sales ratio. Model II estimates in Panel A of Table 6.13 shows that long term debt is switched sign to positively and significantly influences the cash-to-sales estimation. Model II has lower R^2 than Model I, which imply that Model I explains the variation in cash holdings much better. Similar variations are observed in Harford et. al. (2008) and Bates et. al. (2009) in their estimation models.

Table 6.13: Pooled OLS and fixed effect regression for cash to sales

This table presents the OLS regression (Panel A) and fixed effects regression (Panel B) for cash to sales for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients for cash to sales (cash and cash equivalent scaled by sales). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	Panel A - OLS regression						Panel B - fixed effects regression					
cash/sales	year dummy			year and industry dummy			year dummy			year and industry dummy		
firmage	0.018**	-0.043**	0.016*	-0.020	0.035**	-0.024+	0.018	-0.040+	0.008	-0.004	0.032**	-0.016
	(0.006)	(0.013)	(0.008)	(0.013)	(0.007)	(0.013)	(0.012)	(0.024)	(0.013)	(0.021)	(0.011)	(0.020)
m2b	-0.234**	-0.157**	-0.111+	-0.239*	-0.122	-0.113	-0.234**	-0.157**	-0.111+	-0.239*	-0.122	-0.113
	(0.058)	(0.061)	(0.060)	(0.102)	(0.098)	(0.093)	(0.058)	(0.061)	(0.060)	(0.102)	(0.098)	(0.093)
own1	-0.027	0.170	-0.006	0.146	-0.412	-0.294	-0.044	0.090	0.114	0.269	-0.092	0.030
	(0.454)	(0.447)	(0.493)	(0.491)	(0.489)	(0.487)	(0.544)	(0.538)	(0.591)	(0.582)	(0.589)	(0.578)
ltips	-0.898	-0.580	-0.578	-1.082	-1.117	-1.122	-0.708	-0.434	-0.869	-1.246	-1.155	-1.146
	(0.759)	(0.726)	(0.868)	(0.831)	(0.886)	(0.816)	(0.676)	(0.631)	(0.851)	(0.804)	(0.879)	(0.816)
s_options	-1.407	-0.645	-2.635*	-2.745*	-3.008*	-2.657*	-1.477	-1.284	-1.778	-1.954	-1.870	-1.868
	(1.483)	(1.442)	(1.220)	(1.195)	(1.230)	(1.185)	(1.420)	(1.399)	(1.319)	(1.298)	(1.331)	(1.294)
shortdebt	-0.007	-0.020*					-0.015	-0.022*				
	(0.009)	(0.009)					(0.010)	(0.010)				
size	-0.079**	-0.073**	-0.132**	-0.074**	-0.094**	-0.091**	-0.080**	-0.069**	-0.157**	-0.137**	-0.084**	-0.076**
	(0.016)	(0.016)	(0.021)	(0.026)	(0.012)	(0.013)	(0.023)	(0.022)	(0.031)	(0.034)	(0.019)	(0.018)
fcf	0.050	0.001	0.611**	0.601**	0.617**	0.598**	0.133	0.091	0.539**	0.547**	0.545**	0.551**
	(0.092)	(0.092)	(0.043)	(0.043)	(0.043)	(0.042)	(0.089)	(0.089)	(0.043)	(0.043)	(0.043)	(0.043)
vol	5.272**	5.133**	6.397**	5.475**	6.719**	7.261**	1.937	2.097	3.487+	2.306	4.530*	4.102*
	(1.844)	(1.675)	(1.828)	(1.704)	(1.803)	(1.697)	(1.887)	(1.643)	(1.876)	(1.683)	(1.895)	(1.719)
invest	0.320**	0.258**	0.128**	0.108**	0.189**	0.137**	0.449**	0.417**	0.277**	0.252**	0.307**	0.267**
	(0.039)	(0.039)	(0.038)	(0.038)	(0.037)	(0.037)	(0.045)	(0.045)	(0.043)	(0.043)	(0.042)	(0.042)
dy	-1.081*	-0.816+	-0.949+	-0.658	-0.051	0.056	-0.380	-0.220	-0.371	-0.263	0.088	0.213
	(0.488)	(0.478)	(0.520)	(0.514)	(0.528)	(0.517)	(0.448)	(0.443)	(0.487)	(0.485)	(0.506)	(0.503)
tp	0.204	0.238	0.063	0.120	0.117	0.213	0.059	0.119	-0.007	0.061	0.012	0.112
	(0.230)	(0.224)	(0.248)	(0.244)	(0.245)	(0.240)	(0.203)	(0.202)	(0.223)	(0.224)	(0.224)	(0.224)
logbsize	0.294**	0.156*	0.198**	0.105	0.287**	0.130+	0.064	0.001	-0.069	-0.092	0.014	-0.043
	(0.067)	(0.068)	(0.071)	(0.071)	(0.068)	(0.069)	(0.080)	(0.080)	(0.085)	(0.084)	(0.083)	(0.082)
fractionnex	0.279*	0.316*	0.383**	0.453**	0.390**	0.470**	0.209	0.372**	0.279+	0.466**	0.293+	0.516**
	(0.132)	(0.123)	(0.139)	(0.131)	(0.137)	(0.129)	(0.158)	(0.142)	(0.166)	(0.150)	(0.165)	(0.148)
duality	0.064	0.087	0.039	0.033	0.051	0.030	-0.004	0.023	-0.040	-0.023	-0.037	-0.016
	(0.069)	(0.067)	(0.071)	(0.070)	(0.070)	(0.069)	(0.078)	(0.077)	(0.080)	(0.079)	(0.079)	(0.078)

longdebt			0.039*	-0.023					0.074**	0.057+		
			(0.018)	(0.023)					(0.026)	(0.030)		
mktdebt					-0.508**	-0.576**					-0.340**	-0.386**
					(0.085)	(0.087)					(0.113)	(0.110)
Constant	0.824**	1.492**	1.113**	1.538**	0.891**	1.365**	1.603**	1.811**	1.661**	1.666**	1.414**	1.446**
	(0.260)	(0.279)	(0.262)	(0.282)	(0.257)	(0.278)	(0.417)	(0.422)	(0.400)	(0.401)	(0.391)	(0.390)
Observations	1,124	1,124	1,220	1,220	1,220	1,220	1,124	1,124	1,220	1,220	1,220	1,220
R-squared	0.181	0.222	0.290	0.313	0.308	0.336	0.165	0.228	0.197	0.233	0.180	0.246

CEO ownership and LTIPs both have positive and weak relationship with cash-to sales ratio. The results are inconsistent with the hypothesis that equity compensation can be used to align managers' interest with those of shareholders'. However, stock options holdings remain negatively and significantly influence the cash to sales ratio at 5% significant level, similar with cash to asset results.

Free cash flow and volatility remain positive and significantly influence the cash-to-sales ratio. The coefficients of 0.611 and 6.397 indicate that for every 1% increase in free cash flow and firm volatility, cash-to-sales ratio will increase marginally by 0.611 and 6.397point. Firms with high cash flows are more likely to have high cash holdings for internal utilization as reported by Almeida et. al. (2004) Meanwhile, the cash holdings will increase as volatility in share price increases to provide buffer against future cash constraints of the firm. The coefficients for investment have shown positive and significant relationship with cash-to-sales ratio based on OLS regression.

Dividend yield shows negative and significant association with cash-to-sales ratio at 5% significant level. The inverse relationship is similarly noted for cash-to-asset ratio. Meanwhile, total payout shows positive but weak association with cash to sales ratio. However, the coefficients in Panel B for fixed effects regressions show that both dividend yield and total payout failed to have significance results.

Corporate governance variables show positive results. The log of board size and fraction of non-executive directors' coefficients are positive and significant at 1% significance level. This support the hypothesis that firms with strong board will influence the management to hold more cash when investment opportunities are low as

better alignment with managers and shareholders. Meanwhile, CEO duality has weak influence over cash to sales ratio. This indicates that dual role has little impact the corporate financial policy with regards to cash holdings due to conflict of interest between managers and governing board. The findings of corporate governance are in line with hypothesis and similar to studies reported by Ozkan and Ozkan (2004) and Pinkowitz et. al. (2006). The results hold for fixed effects regression in Panel B for fraction of non-executive directors. The overall results are in line with expectation that corporate governance mechanism increases the cash holding as proposed by Pinkowitz et. al. (2006) and Dittmar and Mahrt-Smith (2007) due to better alignment of interest between managers and external shareholders of the firm.

Table 6.14 presents the regression results for cash-to-market value. In this analysis, only total market debt shows negative and significant results compared with cash-to-asset and cash-to-sales. CEO ownership and LTIP produce insignificant results whereas stock options remains negatively and significantly related to cash ratio at 5% significance level. The results indicate that when stock options increase by 1%, the cash-to-market value decreases by 1.732%.

For corporate governance variables, only fraction of non-executive directors holds positive and significant impact on cash-to-market value ratio, similar with the cash-to-asset results. Both log of board size and CEO duality show no significance results in both the OLS and fixed effects regressions. This model shows inconclusive results on firms having CEO with dual roles will negatively impact the financial policy of the firms in the sample and board independence increase the alignment between managers and shareholders.

Table 6.14: Pooled OLS and fixed effect regression for cash to market value

This table presents the OLS regression (Panel A) and fixed effects regression (Panel B) for cash to market value for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients for cash to market value (cash and cash equivalent scaled by market value). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	Panel A - OLS regression						Panel B - fixed effects regression					
cash/mv	year dummy			year and industry dummy			year dummy			year and industry dummy		
firmage	0.004	-0.009	0.005	-0.006	0.013*	-0.007	0.004	-0.008	0.005	-0.004	0.013*	-0.005
	(0.005)	(0.012)	(0.006)	(0.010)	(0.005)	(0.010)	(0.006)	(0.013)	(0.007)	(0.012)	(0.006)	(0.011)
m2b	-0.073	-0.073	-0.053	-0.077	-0.077	-0.056	-0.024	-0.019	0.006	-0.024	-0.018	0.005
	(0.055)	(0.054)	(0.054)	(0.054)	(0.052)	(0.052)	(0.056)	(0.054)	(0.054)	(0.054)	(0.052)	(0.052)
own1	-0.221	-0.124	-0.249	-0.131	-0.479	-0.381	-0.241	-0.137	-0.290	-0.141	-0.505	-0.384
	(0.385)	(0.390)	(0.381)	(0.385)	(0.380)	(0.385)	(0.411)	(0.413)	(0.425)	(0.417)	(0.421)	(0.413)
ltips	-0.532	-0.467	-0.425	-0.491	-0.543	-0.582	-0.852	-0.866	-0.825	-1.011	-0.752	-1.018
	(0.802)	(0.821)	(0.806)	(0.803)	(0.806)	(0.801)	(0.788)	(0.771)	(0.782)	(0.751)	(0.791)	(0.749)
s_options	-1.732*	-1.756*	-1.502*	-1.559*	-1.600*	-1.510*	-1.627*	-1.797*	-1.560*	-1.736**	-1.602*	-1.750**
	(0.704)	(0.707)	(0.659)	(0.655)	(0.657)	(0.654)	(0.712)	(0.713)	(0.673)	(0.670)	(0.675)	(0.671)
shortdebt	-0.002	-0.010					-0.001	-0.008				
	(0.008)	(0.008)					(0.008)	(0.008)				
size	0.011	0.020	-0.008	0.029	-0.001	0.004	0.007	0.016	-0.010	0.022	-0.001	0.004
	(0.013)	(0.014)	(0.016)	(0.020)	(0.010)	(0.010)	(0.014)	(0.015)	(0.019)	(0.023)	(0.011)	(0.011)
fcf	-0.043	-0.046	0.016	0.008	0.020	0.008	-0.016	-0.027	0.016	0.010	0.019	0.010
	(0.079)	(0.080)	(0.034)	(0.034)	(0.033)	(0.033)	(0.080)	(0.081)	(0.035)	(0.034)	(0.034)	(0.034)
vol	9.227**	5.732**	9.872**	6.651**	9.893**	7.475**	8.611**	4.995**	8.757**	5.565**	9.051**	6.589**
	(1.568)	(1.467)	(1.479)	(1.401)	(1.456)	(1.398)	(1.613)	(1.489)	(1.553)	(1.428)	(1.533)	(1.426)
invest	0.039	0.009	-0.001	-0.011	0.032	0.005	0.031	0.005	0.002	-0.008	0.028	0.006
	(0.033)	(0.034)	(0.031)	(0.031)	(0.030)	(0.030)	(0.035)	(0.035)	(0.034)	(0.033)	(0.033)	(0.032)
dy	8.229**	8.152**	8.086**	8.075**	8.704**	8.572**	8.450**	8.355**	8.452**	8.340**	8.982**	8.795**
	(0.415)	(0.417)	(0.407)	(0.411)	(0.419)	(0.420)	(0.416)	(0.417)	(0.409)	(0.411)	(0.423)	(0.422)
tp	-0.223	-0.207	-0.255	-0.221	-0.219	-0.167	-0.263	-0.249	-0.297	-0.264	-0.272	-0.214
	(0.195)	(0.195)	(0.192)	(0.192)	(0.191)	(0.191)	(0.194)	(0.195)	(0.190)	(0.191)	(0.189)	(0.189)
logbsize	-0.012	-0.072	-0.008	-0.059	0.015	-0.062	-0.024	-0.076	-0.043	-0.077	-0.017	-0.073
	(0.058)	(0.059)	(0.056)	(0.057)	(0.053)	(0.055)	(0.061)	(0.063)	(0.062)	(0.061)	(0.059)	(0.059)
fractionnex	0.126	0.252*	0.226*	0.345**	0.209+	0.336**	0.149	0.274*	0.264*	0.376**	0.247*	0.369**
	(0.113)	(0.108)	(0.108)	(0.104)	(0.107)	(0.102)	(0.120)	(0.113)	(0.120)	(0.110)	(0.118)	(0.108)
duality	0.006	0.006	0.002	-0.000	0.004	-0.004	0.003	0.004	-0.017	-0.010	-0.015	-0.011

	(0.058)	(0.059)	(0.055)	(0.055)	(0.054)	(0.054)	(0.062)	(0.062)	(0.060)	(0.059)	(0.059)	(0.058)
longdebt			0.006	-0.030					0.008	-0.023		
			(0.014)	(0.018)					(0.017)	(0.020)		
mktdebt					-0.345**	-0.368**					-0.342**	-0.365**
					(0.071)	(0.073)					(0.079)	(0.079)
Constant	-0.601**	-0.438+	-0.433*	-0.273	-0.510*	-0.339	-0.525*	-0.388	-0.332	-0.238	-0.425+	-0.324
	(0.222)	(0.244)	(0.204)	(0.223)	(0.200)	(0.221)	(0.243)	(0.265)	(0.242)	(0.251)	(0.236)	(0.245)
Observations	1,115	1,115	1,202	1,202	1,202	1,202	1,115	1,115	1,202	1,202	1,202	1,202
R-squared	0.412	0.411	0.400	0.401	0.412	0.413	0.312	0.320	0.297	0.308	0.296	0.310

Volatility remains positive and significantly influence the cash-to-market value ratio. The coefficient of 9.227 indicates that for every 1% increase in firm volatility, cash-to-market value ratio will increase by 9.227 point. This shows that cash holdings will increase as volatility in share price increases in anticipation of future cash flow shock as predicted by Opler et. al. (1999) However, the coefficients for investment have little impact on cash-to-market value ratio based on OLS regression and fixed effects regression.

Dividend yield provides positive and significant results for cash-to-market value ratio at 1% significance level. This is contradictory with the cash-to sales findings. Meanwhile, total payouts provide negative and insignificant results. This mixed findings show that dividend has more positive influence on cash-to-market value ratio compared with other cash ratios.

Table 6.15 presents the regression results for log of cash holdings. CEO share ownership show the negative coefficient of 2.376 at 10% significance level while LTIPs show similar sign at 10% significance level. The results are inconsistent with the findings for cash-to-sales ratio. This imply that CEO shareholding and LTIPs awards negatively influence the level of cash holding of the firm. Similarly, stock options results are negatively and significantly related to log of cash holdings as observed in cash ratios analysis.

Firm size, free cash flows, investment and firm volatility provide positive and significant results. As noted before, cash holdings will increase as volatility in share price increases to provide buffer against future cash constraints of the firm. Larger firms

are expected to hold more cash compared to smaller firms. Additionally, firms with high cash level will invest more compared to firms with low cash holdings as firms are able to fund projects with internal cash reserves.

Looking at the corporate governance variables, the results are mixed. The log of board size and fraction of non-executive directors coefficients are positive and significant at 1% and 5% significant level. This also supports the hypothesis that firms with strong board will influence the management to hold more cash when investment opportunities are low as better alignment with managers and shareholders. Meanwhile, CEO duality provides negative coefficients. The results for CEO duality in fixed effects regression show insignificant coefficients.

Other predictive variable, dividend yield gives a negative and significant result at 5% significance level compared to insignificant results for total payouts. Using the fixed effects regression, the dividend yield loses the significance as per previous cash ratios. Total market debt also negatively and significantly impact the level of cash holdings. The variation between both OLS regression and fixed effects regression shows that within sample effect is high for unobserved firms.

Overall, the results for log cash show support to the testing hypothesis on the effect of CEO ownerships, stock options dividends, corporate governance and controlling variables in the sample firms.

Table 6.15: Pooled OLS and fixed effect regression for log of cash

This table presents the OLS regression (Panel A) and fixed effects regression (Panel B) for log of cash for a sample of 183 firms listed on the FTSE 350 from 1999 to 2008. The table reports coefficients for log of cash (log of cash to non-cash assets). Explanatory variables are own1 (managerial share ownership to total non-cash assets), LTIPs (managerial LTIPs portfolio to total non-cash assets), s_options (managerial stock options holding to total non-cash assets), fractionnex (fraction of non-executive directors to board size), logbsize (natural logarithm of board size) and duality (CEO and Chairman duality, dummy=1 if dual role and 0 otherwise). Control variables are shortdebt (short-term debt scaled by non-cash assets), longdebt (long-term debt scaled by non-cash assets), size (natural logarithm of sales), vol (volatility of cash of firms), invest (capital expenditure scaled by non-cash assets), mktdebt (total liabilities to total non-cash assets), tp (total payout) and dy (dividend yield). Standard errors in parentheses. ** p<0.01, * p<0.05, + p<0.1

	Panel A - OLS regression						Panel B - fixed effects regression					
logcash	year dummy			year and industry dummy			year dummy			year and industry dummy		
firmage	0.045*	-0.035	0.034	0.021	0.109**	-0.012	0.045	-0.039	0.012	0.066	0.087*	0.025
	(0.021)	(0.045)	(0.022)	(0.038)	(0.019)	(0.036)	(0.053)	(0.119)	(0.050)	(0.110)	(0.042)	(0.095)
m2b	-0.076	-0.105	-0.061	-0.036	-0.055	-0.059	-0.056	-0.050	0.153	0.073	0.067	0.135
	(0.217)	(0.210)	(0.202)	(0.135)	(0.132)	(0.134)	(0.216)	(0.209)	(0.201)	(0.138)	(0.134)	(0.137)
own1	-0.075	0.795	-0.455	0.603	-2.376+	-1.490	-0.261	0.083	-0.423	-0.182	-0.744	-0.173
	(1.500)	(1.486)	(1.473)	(1.460)	(1.422)	(1.412)	(1.490)	(1.489)	(1.472)	(1.463)	(1.483)	(1.478)
ltips	-2.146	-1.529	-2.929	-6.976+	-5.523	-4.142	-2.592	-4.274	-4.600	-5.086	-4.810	-3.115
	(3.589)	(3.781)	(3.609)	(4.089)	(3.602)	(3.114)	(2.988)	(3.269)	(3.086)	(3.486)	(3.287)	(2.188)
s_options	-7.297+	-8.017*	-8.454*	-10.223**	-10.505**	-10.258**	-5.120	-5.495+	-3.729	-4.170	-3.664	-4.226
	(3.844)	(3.576)	(3.580)	(3.376)	(3.680)	(3.360)	(3.242)	(3.188)	(3.141)	(3.088)	(3.198)	(3.128)
shortdebt	-0.027	-0.048					-0.018	-0.032				
	(0.031)	(0.031)					(0.027)	(0.027)				
size	0.930**	0.924**	0.711**	0.761**	0.855**	0.851**	0.750**	0.839**	0.549**	0.522**	0.793**	0.849**
	(0.052)	(0.053)	(0.063)	(0.077)	(0.036)	(0.037)	(0.079)	(0.077)	(0.097)	(0.108)	(0.063)	(0.066)
fcf	0.382	0.202	0.500**	0.446**	0.545**	0.465**	0.236	0.129	0.259*	0.261**	0.267**	0.257*
	(0.310)	(0.312)	(0.130)	(0.127)	(0.124)	(0.122)	(0.233)	(0.232)	(0.101)	(0.100)	(0.102)	(0.101)
vol	6.845	3.720	12.086*	5.095	11.241*	11.752*	0.241	-3.666	2.506	-3.706	6.140	0.056
	(6.090)	(5.588)	(5.711)	(5.305)	(5.449)	(5.123)	(4.930)	(4.217)	(4.626)	(3.966)	(4.743)	(4.159)
invest	0.859**	0.707**	0.517**	0.425**	0.841**	0.670**	0.270*	0.241+	0.183	0.148	0.267*	0.217+
	(0.136)	(0.136)	(0.124)	(0.123)	(0.117)	(0.117)	(0.129)	(0.129)	(0.114)	(0.113)	(0.114)	(0.113)
dy	-2.580	-1.866	-3.807*	-2.495	1.388	1.651	-0.463	0.019	-0.792	-0.466	0.568	0.555
	(1.607)	(1.582)	(1.567)	(1.551)	(1.562)	(1.534)	(1.128)	(1.108)	(1.114)	(1.083)	(1.189)	(1.166)
tp	0.660	0.980	0.627	0.888	0.888	1.344+	0.368	0.565	0.378	0.524	0.398	0.604
	(0.755)	(0.742)	(0.740)	(0.725)	(0.711)	(0.696)	(0.504)	(0.500)	(0.498)	(0.485)	(0.507)	(0.495)
logbsize	0.836**	0.491*	0.741**	0.448*	1.017**	0.574**	0.013	-0.087	-0.114	-0.202	0.068	-0.092
	(0.223)	(0.226)	(0.215)	(0.214)	(0.198)	(0.202)	(0.221)	(0.222)	(0.209)	(0.208)	(0.209)	(0.210)
fractionnex	1.048*	1.338**	1.433**	1.629**	1.338**	1.691**	0.093	0.867*	0.373	0.904*	0.386	1.075**
	(0.439)	(0.410)	(0.418)	(0.392)	(0.401)	(0.374)	(0.436)	(0.391)	(0.416)	(0.375)	(0.418)	(0.377)
duality	-0.238	-0.222	-0.395+	-0.364+	-0.361+	-0.368+	-0.168	-0.083	-0.278	-0.200	-0.309	-0.207

	(0.226)	(0.223)	(0.210)	(0.208)	(0.202)	(0.199)	(0.210)	(0.209)	(0.191)	(0.189)	(0.192)	(0.191)
longdebt			0.137*	0.063					0.220**	0.293**		
			(0.055)	(0.069)					(0.076)	(0.082)		
mktdebt					-2.732**	-2.739**					-1.120**	-0.722*
					(0.263)	(0.267)					(0.312)	(0.311)
Constant	-3.605**	-1.811+	-2.153**	-0.529	-2.952**	-1.291	2.376	1.382	2.052	1.514	0.947	0.488
	(0.863)	(0.934)	(0.787)	(0.847)	(0.749)	(0.812)	(1.536)	(1.567)	(1.369)	(1.468)	(1.297)	(1.412)
Observations	1,108	1,108	1,195	1,195	1,195	1,195	1,108	1,108	1,195	1,195	1,195	1,195
R-squared	0.428	0.449	0.419	0.442	0.465	0.488	0.600	0.661	0.609	0.654	0.583	0.657

6.7 Conclusion

This study investigates the determinants of cash holdings based on and agency model. The analysis documents that CEO ownership and LTIPs both have positive and strong relationship with cash ratios. However, stock options awards have adverse effect on the cash ratios and log of cash holdings. The results support the hypothesis that equity compensation such as shares and LTIPs can be used to align managers' interest with those of shareholders' in the case of precaution motives of cash holdings

Dividend yield shows mixed findings across the cash ratios used in this analysis. However, firm size, free cash flows, investment and firm volatility provide positive and significant results. As noted in the literature, cash holdings will increase as volatility in share price increases to provide a buffer against future cash constraints of firms. Larger firms are expected to hold more cash compared to smaller firms. Additionally, firms with high cash levels will invest more compared to firms with low cash holdings because the former are able to fund projects with internal cash reserves.

Looking at the corporate governance variables, the results are mixed. The log of board size and the fraction of non-executive directors have strong and positive influences on cash holdings. This also supports the hypothesis that firms with strong boards will influence management to hold more cash when investment opportunities are low and thereby create a better alignment between managers and shareholders. In addition, CEO duality provides mixed signs of positive and negative coefficients. The inconclusive results for CEO duality show little impact on the overall influence of corporate governance.

Chapter 7: Conclusion

In this thesis, I examine the interaction between CEO pay, capital structure, payouts and cash holding policy. The basis of this research is that shareholders need to deploy an effective mechanism to align their interests with those of managers. Because the agents' actions and decisions are unobservable to the principal, the compensation structure is designed to reward managers whose efforts maximise shareholders' wealth.

This study provides some interesting evidence on managerial behaviour and corporate governance from the CEO compensation perspective. It also extends prior literature on the link between managerial behaviour and compensation. This is based on contract alignment theory, which suggests that managers could be induced to take optimal actions when their compensation packages are tied to firm performance. By offering high-powered incentives whereby executives' compensation is linked to a firm's share price, managers will be more aligned with shareholders' desire to maximise shareholders' value. The main findings show that CEO share ownership and LTIPs have positive effects on corporate payout policy. The Tobit regression for CEO total compensation finds a positive association with dividend payout. Further, the logistic regression shows a strong association between CEO shareholding and the likelihood of dividend payouts, while LTIPs influence the likelihood of share repurchase programmes. This is because high CEO incentives will increase the total payouts of the firm because of an alignment of interest between managers and shareholders. When managers are compensated in cash and equity pay, the results show a high association between equity incentives and a firm's payout.

7.1 Summary of Research Findings

7.1.1 Pay-Performance Sensitivity and Leverage

Chapter 4 examines the relationship between CEO pay-performance sensitivity, debt and corporate governance. I expect that pay-performance sensitivity will be high for high-levered firms. This is because debt can mitigate agency conflicts between managers and shareholders. Debt will induce lenders to monitor the firm, reducing the free cash flow available to managers and forcing them to focus on shareholders' wealth maximisation when facing a bankruptcy threat. This research develops empirical evidence to investigate the effect of capital structure on pay-performance sensitivity. It shows that firm's leverage has little effect on pay-performance sensitivity as a mechanism to align the interests of CEOs and debt holders of firms.

This research contributes to existing literature which focuses on short-term and long-term incentives. Much of the past research on executive compensation focuses on aggregate pay measures. As a result, there are few UK studies which analyse exclusively the relation between executive pay-performance sensitivity and capital structure using several measures of pay-performance sensitivity. Evidence also indicates a shortage of UK research which examines the association between capital structure and performance targets. By examining the impact of debt on pay-performance sensitivity, management can determine the effectiveness of setting debt levels in order to monitor managers for improper conduct and to decide on possible disciplinary action.

However, the results indicate that higher ownership will influence the pay-setting process. Therefore, the results provide strong support to the managerial power perspective that CEO ownership increases managerial power over compensation

decisions in such a way as to influence the compensation structure and pay-performance sensitivity, a situation which offsets the effectiveness of debt holders as a monitoring mechanism in firms. CEO ownership indicates lower pay-performance sensitivity because of lower monitoring by shareholders when ownership is high. The negative relationships could support the argument that debt holders could substitute as a monitoring device (Jensen, 1986; Williamson, 1988; John and John, 1993).

7.1.2 CEO Pay and Corporate Payout Policy

In Chapter 5, I investigate the link between CEO pay and corporate payout policy. The objective is to determine whether CEO compensation structure and corporate governance mechanisms have effects on payout policy. The results show that CEO share ownership and LTIPs have positive effects on corporate payout policy. The Tobit regression for CEO total compensation finds a positive association with dividend payout. Further, the logistic regression shows a strong association between CEO shareholding and the likelihood of dividend payouts, while LTIPs influence the likelihood of share repurchase programmes. This is because high CEO incentives will increase the total payouts of the firm because of an alignment of interest between managers and shareholders.

Finance literature has examined many aspects of what influences corporate payout decisions. Early research shows that the degree of alignment of interest between managers and shareholders affects payout policy. A better alignment of interest could curb overinvestment or underinvestment problems; thus, the need for regular payouts to mitigate agency conflicts could decline as alignment increases. Several studies find

support for this hypothesis and document a negative association between managerial shareholding and dividends (Rozeff, 1982; Eckbo and Verma, 1992).

Another strand of literature argues that when firms accumulate excess funds, irregular payouts of share repurchases are likely to increase with the level of managerial share ownership. However, the results of the association between share repurchases and managerial ownership have been inconclusive. For example, Bates et al. (2009) find that payouts to shareholders increase with the level of equity ownership by officers and directors. In contrast, Fenn and Liang (2001) find no significant relation between repurchase yields and the level of equity owned by management. However, they also find that managerial stock ownership increases the total payouts for firms with low investment opportunities and high free cash flows.

My results show that CEO shareholdings, LTIPs and total equity incentives have a positive impact on dividend payouts. The findings support the hypothesis that CEO ownership and compensation packages are able to align managers' and shareholders' interests in order to mitigate free cash flow problems. However, corporate governance variables show inconclusive results on the link between CEO compensation and payout policy.

In contrast, a high level of stock option holdings is associated with a lower level of dividend payments and higher share repurchases. Prior studies by Lambert et al. (1989) and Fenn and Liang (2001) find that companies with high executive stock options outstanding will reduce dividend payments and substitute these with share repurchases. This research also supports the proposition that high CEO incentives will increase the total payouts of firms because of an alignment of interest between managers

and shareholders.

7.1.3 CEO Pay and Cash

Chapter 6 examines the link between CEO ownership, corporate governance and cash holding policy. This study investigates the determinants of cash holdings based on the agency model. The analysis centres on the view that managerial incentives are important in setting the cash policy of firms. To conduct the investigation, I have constructed four cash holding proxies to build and extend on prior studies by Opler et al. (1999) and Bates et al. (2009). The study documents that CEO ownership and log LTIPs both have negative and strong relationships with cash ratios while stock options provide mixed results.

Looking at the corporate governance variables, the results are mixed. The log of board size and the fraction of non-executive directors have strong and positive influences on cash holdings. This also supports the hypothesis that firms with strong boards will influence management to hold more cash when investment opportunities are low in order to improve alignment between managers and shareholders. Meanwhile, CEO duality provides mixed signs of positive and negative coefficients. The inconclusive results for CEO duality shows little impact on overall corporate governance influence.

With regard to dividend yield, there are mixed findings across the cash ratios used in this analysis. However, firm size, free cash flows, investment and firm volatility provide positive and significant results. Prior studies suggest that cash holdings will increase as volatility in share price increases in order to provide a buffer against future cash flow shocks to the firm. Meanwhile, larger firms are expected to hold more cash

compared to smaller firms because of higher operating costs. Additionally, firms with high levels of cash holdings will invest more in capital expenditure compared to firms with low cash holdings because the former are able to fund projects with internal cash reserves.

7.2 Implications of Research Findings

The main conclusions and implications of this thesis can be summarised as follows. The manager-shareholder conflict is costly for firms where there is a distinct separation between ownership and control. It is established among finance scholars that managers tend to pursue their own interests with minimal effort instead of focusing on shareholders' wealth maximising activities. In order to align managers' and shareholders' interests, the managerial compensation contract is designed to provide an incentive for managers to reduce moral hazard and increase shareholders' value (Holmstrom, 1979).

Contract alignment theory provides several strategies for firms to alleviate the manager-shareholder conflict of interest. Agency theory suggests that debt can affect the agency conflicts between managers and shareholders. Capital structure can affect executive compensation because debt can mitigate agency conflicts between managers and shareholders. Debt will induce lenders to monitor firms, reducing the free cash flow available to managers and forcing them to focus on shareholders' wealth maximisation when facing a bankruptcy threat. This theory predicts that when higher debt and high alignment incentives can be substituted, pay-performance sensitivity will be lower for firms with higher debts. In Chapter 3, the estimates show mixed support for pay-performance and leverage because the negative coefficients for market debt have overall weak significance. It can be concluded that firms' leverage has little effect on pay-

performance sensitivity as a mechanism to align the interests of the CEOs and debt holders of firms.

From the theoretical perspectives, the little effect of debt on pay-performance sensitivity may be attributed to implementation of corporate governance mechanism to reduce the effect of debtholders monitoring. With this regards, the practitioners could establish a level of executive compensation not to be driven by short term performance target but also devise compensation package that adhere to good governance.

Meanwhile, the positive relationship between CEO ownership and LTIPs with corporate payouts policy show that CEO compensation package can be used to increase shareholders' return. This analysis implies that companies can offer a mix of equity compensation to encourage top management in pursuing shareholders' wealth maximization goals.

Consequently, changes in ownership structure (e.g. the level of managerial ownership), CEO compensation structure (e.g. the levels of salary, bonus, shares and and stock options) and financial structure (e.g. the levels of long-term debt and the dividend ratio) can be used to reduce the friction between managers and shareholders. These corporate governance mechanisms do not work independently and raise the issue of endogeneity in the findings.

This study also employs the fixed effect regression model (OLS panel data regression) in Chapter 4. The fixed effects analysis estimates the fixed effects of predictors on the dependent variables by controlling the constant variations coming from omitted variables and unobserved heterogeneity between groups over time.

7.3 Limitations of Research and Areas for Future Study

There are several limitations in conducting the research, especially in sample and methodology. A challenging issue in the executive compensation literature is identifying the fundamental nature of the components. Central to this problem is measuring the different compensation elements which comprise the total compensation package. Cash compensations (e.g. salary, bonus, benefits and allowances) do not include complex measures and are usually provided directly by the remuneration reports in the companies' annual reports. However, non-cash compensations (e.g. LTIPs, ESOs and restricted shares) have a different nature and are more complex than cash compensations. Following prior studies, stock options are measured using the modified Black-Scholes formula for European call options. LTIPs are evaluated using the face value of the scheme.

The process of manual data collection is also time-consuming. The drawback of identifying the relevant information from old annual reports and manually recording it may lead to some miscategorising of the compensation (e.g. benefit in kind and deferred benefit) which is painstaking to recheck and corrected. The study will be improved if there is a database for UK executive compensation such as ExecuComp in US. This will also pave ways for future researchers to analysed UK data if readily available online.

In terms of the explanatory variables used in this research, some limitations should be taken into consideration when analysing the results. For instance, the CEO age and tenure are not included as characteristics of corporate governance. The inclusion may influence the findings for Chapter 6, but due to limited information in annual reports and inclusion of other board characteristics (CEO duality, board size and

composition), this study can be claimed to cover the corporate governance mechanism. Future research may elaborate further on other corporate governance characteristics and use different control variables in analysis.

Three models are constructed to test the research hypotheses. The executive compensation data with regard to the models' variables was hand-collected from the annual reports for the financial years 1999 to 2008 for 183 UK firms listed in the FTSE 350. The financial and market data were obtained from Datastream and Worldscope. The compensation data were recent in order to capture the effect of the Greenbury Report (1995) with regard to the UK Corporate Governance Code (2003) and the Directors' Remuneration Report Regulations (2002).

Suggested future research areas to be explored are as follows. As proposed by studies which examine debt structure as a bonding mechanism to control self-interested managers, there is a need to develop more robust proxies for managerial compensation structures, corporate governance mechanisms and firms' financial policies. Because more studies are done in the US context, it would also be beneficial to probe the setting of managerial entrenchment and corporate governance in other developed markets such as the UK for meaningful comparison.

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