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Abstract

This paper examines the relationship between executive cash compensation and company performance for a sample of large UK companies, focusing in particular on the financial services industry, since incentive misalignment has been blamed as one of the factors causing the global financial crisis of 2007/08. We show that base salary and bonuses of UK executives has increased substantially over this period 1994-2006, and we provide evidence on the movement in the pay-performance sensitivity over time. We find that although pay in the financial services sector is high, the cash pay-performance sensitivity of banks and financial firms is not significantly higher than in other sectors. We claim that this finding of a low sensitivity of pay and performance questions the rationale for regulatory changes to remuneration practices in the banking sector. For all companies we identify an asymmetric relationship between pay and performance: for companies in which stock returns are relatively high, pay-performance elasticities are high, but we find that executive pay is less sensitive to performance when stock returns are low.

Keywords: Executive compensation, pay and performance
JEL Classification: G34, J33, M52

I Introduction

The global banking crisis of 2007-08 has been partly blamed on remuneration policies in financial institutions. According to Turner (2009) "*There is a strong prima facie case that inappropriate incentive structures played a role in encouraging behaviour which contributed to the financial crisis*", (p. 79). In this paper we evaluate this claim by examining the pay-performance relationship of executives in all UK companies, and in financial services companies in particular.[1] We argue that if an emphasis on short-term profits in the banking sector meant that remuneration structures in banks and financial services were to blame for the crisis, we would expect to find evidence that prior to the crisis the pay-performance relationship in the financial services sector was both excessive and more responsive than in other sectors. We show that base pay compensation and bonuses of all UK executives increased substantially over the period 1994-2006, and we provide evidence on the movement in the pay-performance sensitivity over time. Contrary to the prediction that pay was over-sensitive to short-term profits, we find that although pay in the financial services sector is high, the pay-performance sensitivity of banks and financial firms is not significantly higher than in other sectors, and is generally quite low. We therefore question how incentive structures in banks could be blamed for the crisis since there is little evidence that executive compensation depended on short-term profits. However we do identify an asymmetric relationship between pay and performance: for companies in which stock returns are high, pay-performance elasticities are relatively high, but we find that executive pay is less sensitive to performance when stock returns are low. Again this is a result we find applies to all firms, not just firms in the financial sector.

A number of recent papers have investigated whether the performance of US banks during the financial crisis was related to executive incentives before the crisis. Fahlenbrach and Stulz (2010) note that perverse incentives are dampened if the interests of executives and shareholders are aligned through executives' ownership of company stock. They find no evidence that banks with CEOs whose incentives were less well aligned with the interests of their shareholders performed worse during the crisis. Conyon, et al (2010) show that the role of compensation in promoting excessive risk taking prior to the crisis, was dwarfed by the roles of loose monetary policy, social housing policies, and financial innovations. Adams

[1] FSA (2009a) suggests that "further research to establish correlations between remuneration practices (good and bad) and performance could be interesting and worthwhile" (Paragraph 3.3)

(2009) documents that the governance of S&P financial firms is no worse than in S&P non-financial firms, and that US banks receiving bailout money had boards that were more independent than in other banks.

What is the evidence from countries other than the US? Beltratti and Stulz (2010) in a cross-country comparison of the performance of banks during the financial crisis, find that it was the fragility of banks' balance sheets, and in particular their reliance on short-term capital market funding, that explained their poor performance. Erkens, Hung and Matos (2009) examines corporate governance policies in 306 financial institutions across 31 countries during the credit crisis. In contrast to the evidence for US banks, they find that financial firms that used CEO compensation contracts with a heavier emphasis on non-equity incentives (bonuses) rather than equity-based compensation) performed worse during the crisis and took more risk before the crisis. Our paper contributes to this literature by examining the sensitivity of executive compensation to corporate performance in UK financial firms compared to UK non-financial firms prior to the financial crisis.

Following on from the Turner Report, UK policy makers have been at the forefront of moves to establish a regulatory framework that ensures the structure of executive remuneration arrangements is appropriate for the risk-management of financial institutions. The Walker Report (2009a, 2009b), in tandem with the UK's regulator in FSA (2009a, 2009b), analysed the problems with executive remuneration structures in the financial services sector and recommended a number of changes to compensation practices.

Prior to the credit crisis, the UK's Corporate Governance Code had provided requirements on the role of remuneration committees in setting the level and structure of remuneration for executives. The Code enshrined a number of recommendations that arose out of a series of corporate governance reports throughout the nineteen nineties. These recommendations included: splitting the roles of chairman and chief executive (Cadbury, 1992), disclosure of executive pay, establishment of remuneration and audit committees, and linking executive incentive pay to clear performance criteria (Greenbury, 1995), the numbers and responsibilities of non-executive directors on the board (Hampel, 1998), internal control mechanisms and risk management (Turnbull, 1999), and independence of non-executives (Higgs, 2003). The requirements in the Code are applied through the Listing Rules in the FSA Handbook. However Walker (2009a) recognised that remuneration structures governed by the Code had been deficient, and "*had been inconsistent with sound risk management by giving employees incentives to pursue risky policies and in effect undermine the firm's own systems designed to control risk.*" (Paragraph 7.3)

FSA (2009a) identify potential market failures in the structures of remuneration practices in financial services, and suggested that an emphasis on short-term profits by institutional investors has encouraged executive remuneration to be focused on "variable compensation" (bonuses) related to the most recent earnings, without any consideration of the exposure to risk-taking. In addition variable compensation schemes tended to be pro-cyclical, since down-side bonuses are capped at zero. These practices were sustained by pressures in the labour market and weak remuneration committees. In response to these perceived market failures, Walker (2009b) recommended a series of changes to remuneration practices: alignment of compensation and its risks made the responsibility of remuneration committees; transparency of the process and levels of executive pay; deferral of incentive payments; and performance criteria related to long-term profitability. These recommendations and eight key principles on executive remuneration identified in FSA (2009b) were enacted in an updated code for UK banks and building societies that became effective from January 2010.

At the international level remuneration policy has been taken forward through two main channels – the Financial Stability Forum (FSF) and the Committee of European Banking Supervisors (CEBS). FSF (2009) contains a set of principles for sound compensation practices, with similar themes to the Walker Report, and was released at the G20 summit meeting in London (subsequently renamed the Financial Stability Board). In drawing up future regulations for European banks CEBS (2009, 2010) suggest a similar set of remuneration policies, and European Commission (2009) published draft amendments to the Capital Requirements Directive (CRD) which include comparable provisions on remuneration. FSA (2009b) notes that proposals consistent with the principles in FRF (2009) are being considered in Australia, France, the Netherlands, Switzerland, and the US.

Fahlenbrach and Stulz (2010) note that there are a number of different mechanisms to explain the misalignment of incentives and the credit crisis. The version emphasised in FSA (2009a) is that executive pay was too sensitive to short-term profits. But this is a testable relationship which we will examine in this paper. The empirical relationship between executive pay and performance starts from the influential study by Jensen and Murphy (1990), who first identified the pay-performance puzzle: that there is little relationship between these variables. For UK firms, Conyon et al (1995), Main et al (1996), Conyon (1997) and Benito and Conyon (1999) have confirmed these low pay-performance sensitivities (PPS), with typical elasticities of around 0.15. Fernandes at al (2009) report that the positive relationship between CEO pay and firm size documented in the U.S. is pervasive across all countries, although the pay-size elasticity is higher in the U.S. than in other countries. In a comparison of US and UK firms, Conyon and Murphy (2000) found a pay-size relationship of 0.32 for US firms and 0.2 for UK firms.

Murphy (1999) draws a distinction between cash compensation, which includes base salary and annual bonuses (non-equity incentives), and total compensation, which adds in equity incentives such as stock options and LTIPS. The early UK literature relates to only cash compensation due to the difficulty of obtaining information on equity incentive based compensation up to 1997, when the disclosure rules prompted by Greenbury (1995) came into effect. The inclusion of equity incentive payments (Main et al, 1996; Buck et al, 2003; Ozkan, 2010) increases pay-performance sensitivities. Buck et al (2003) argue that LTIPs should be included in the estimation of pay-performance sensitivities, but recognise that including LTIPs and share options will have a "mechanical relation to performance conditions". Conyon and Murphy (2000, Table 2) document that in the 1997 fiscal year equity-based incentive plans (including options and LTIPs) constituted about 40 per cent of UK chief executive's total compensation packages. They also reported that the use of equity-based incentives at that time was less prevalent in the financial services sector than other industries, comprising only 35 per cent of the executives' pay packages. More recently Fernandes *et al* (2009) has undertaken an international comparison of CEO pay and reports that in the UK, equity-based incentive pay constituted 24.9% of UK CEO's compensation package in the year 2006. This suggests that over the period 1997-2006 there has been a decline in the importance of equity-based incentive pay for executives.

In Exhibit 1 we have collected data on non-incentive pay and incentive pay (both equity and non-equity) for a sub-sample of firms in the banking and non-banking sectors from our sample. In the table we have identified the total compensation for four banks and four comparable non-banks (being constituents of the FTSE100 Index). We show the percentage of non-incentive pay (salary), equity incentive pay (options and LTIPs) and non-equity incentive pay (bonuses) for each company between two years 2000 and 2006. Focusing on the average row for each panel, we can see that there is little difference between the banking and non-banking sectors in terms of the percentages of each component of pay. For the total board pay, base pay constitutes around 40 per cent of total compensation in 2000, and has fallen to around 27 per cent by 2006. Bonuses (non-equity incentives) have increased to almost 30 per cent of compensation in the banking sector by 2006, and to 20 per cent in non-banking firms. Equity incentive pay in both banking and non-banking has remained fairly constant at around 45 per cent of total pay. These numbers are roughly comparable with the components identified in Fernandes et al (2009).

In the current paper, we focus on executive pay-performance sensitivity with respect to cash compensation including base salary and non-equity bonuses, and we report below the growth in this cash compensation of UK directors is well above the level of inflation and wage growth. It is the non-equity incentive payments, which were paid on the basis of past short-term profits, that have been most heavily criticised by regulators (Walker, 2009a, 2009b; FSA, 2009), as not being related to long-term profitability. [2]

There is conflicting evidence as to whether the pay-performance relationship has weakened or strengthened over time. Jensen and Murphy (1990) for the US and Gregg et al (1993) for the UK suggested the pay-performance relationship had weakened; but in contrast Hall and Liebman (1998) and Benito and Conyon (1999) found it had increased. Over time corporate governance practices change, and Bertrand and Mullainathan (2001) suggest that firms with stronger corporate governance structures tend to have higher pay-performance sensitivities. Although in the UK Conyon (1997), Benito and Conyon (1999), Girma, Thomson and Wright (2007) and Ozkan (2010) have found little evidence of various corporate governance changes effecting the level and structure of CEO pay. A contribution of the current paper is to assess the movement in the pay-performance relationship from the mid-nineties onwards.

Jensen and Murphy (1990) reported little evidence that relative performance to other firms in the same industry acted as a yardstick to managerial incentives. In contrast, Gibbons and Murphy (1990) established that both industry and market relative performance played an important role in shaping executive pay. They found that market performance had a stronger

[2] These policy documents downplay the role of equity-based compensation schemes (share options and LTIPs) as being problematic, since the policy recommendations under discussion is that incentive compensation schemes in the future should be more equity-based: aligning the interests of executives and shareholders.

effect then relative industry performance using a large sample of 9,425 firm years over the period 1974 to 1984. Previous UK studies that have explored relative performance evaluation (Main et al, 1996; Benito and Conyon, 1999) found insignificant results.

Argarwal and Samwick (1999) report that the level of firm risk (firm return variance) is an important determinant of the level of remuneration and that this is robust across other measures of firm risk. Failure to allow for firm risk will under-estimate the true pay-performance relationship. Garen (1994) showed that firms with higher levels of risk (as measured by betas from a regression of firms' return on the market return) paid their executives more in salary and less in incentive payments. This is consistent with standard principal-agent theory since risk-averse executives should demand higher base salaries and less performance-related pay when risk is high, in order to avoid bearing the firm's idiosyncratic risk. Core and Larcker (1999), Conyon and Murphy (2000), and Garvey and Milbourn (2003) have all incorporated some form of firm risk into models specifying the determination of executive pay.

The rest of the paper is organised as follows. In section II we briefly summarise our methodology for assessing pay-performance sensitivities. Section III describes our dataset, and Section IV provides some descriptive statistics and patterns in UK executive compensation over time. Section V discusses the results of our pay-performance estimates, and we provide some concluding comments in Section VI.

II Methodology

Following Murphy (1999) the standard pay-performance relationship is obtained from the following regression:

$$(ExecPAY)_{it} = \gamma_i + \alpha_t + \beta i(CompPerformance)_{it} + \lambda_i(Controls)_{it} + \varepsilon_{it} \qquad (1)$$

γi refers to a executive/firm specific effect for the executive(s) working in firm i that varies across all executives/firms but is constant across time and α_t is a time trend. Measures of company performance include shareholders' wealth/return, earnings per share, and sales revenues. Control variables include firm size, firm risk, time dummies, number of directors and the number of non-executive directors, as a corporate governance proxy. In our paper pay will be defined as either the total board pay or the pay of the highest paid director.

Since the sample is a cross section of firms of varying sizes and from different industries there are likely to be time invariant unobserved differences between firms, which may explain some of the variation in pay. Examples of unobserved time invariant effects include director quality, and complexity of the firm. In order to allow for this unobserved heterogeneity, the model will be estimated using fixed effect regressions A fixed effects regression is preferred to a random effects model since the unobserved effects are likely to be correlated with explanatory variables, such as firm size. Since we can't distinguish between unobserved effects and time invariant observed variables the industry dummies can only be included in a random effects model.

III Data

1. Sample

There are two main data sources; Hemscott director trading dataset and Datastream. The data sample consisted of 415 companies that were constituents of the FTSE 350 stock market index over the period January 1994 to December 2006. This list included all those companies that were constituents of the index at the end of September 2002; plus all companies that had been constituents of the FTSE 350 during the period 1994-2002, but who had since become members of the FT Small Sectors or Fledgling Sectors; plus those companies that were de-listed from the FTSE 350 index for reasons such as bankruptcy or takeovers. The data on these companies was collected over the period 1994-2002, and subsequently updated to 2006.

Investment trust firms were excluded, as were firms that had less then three years worth of return/account data and other firms that had data unavailable from Datastream. Panel A of Appendix 2 gives details on how the final sample of 415 firms was constructed. Panel B in Appendix 2 shows the distribution of firms across fiscal years, where companies are allocated to a fiscal year by the date of their accounting year-end. There will not necessarily be 350 firms in any year, since firms may have left the FTSE 350 but still be listed on the London Stock Exchange, or firms may have unavailable data. The first and last years will have relatively fewer firms since some firms may not have complete accounting year data if their relevant accounting year started or finished outside the sample period.

2. Dependent Variables

For each company in the dataset, we collected two measures of directors' compensation from Datastream annual company accounts: the total remuneration of the whole board and the pay of the highest paid director. Total board pay (Datastream code 126 (£'000s)) includes the total of all base salaries and bonuses, directors fees, emoluments for management services and pension contributions paid to, or on behalf of directors. Following the introduction of FRS3 (June 1993), compensation for loss of office and ex gratia payments are included. Pay of the highest paid director (Datastream code 244 (£'000s)), represents the highest remuneration paid to any director for the period. Although we would typically expect this to be the company's CEO, a note of caution is that this variable might apply to a different director each year, if for some reason a large payment was made to some other director. Common to other studies we take log values of pay.

3. Accounting Years

The directors' compensation variables are annual payments relating to the company's accounting year. The cross-sectional units in the panel were aligned on the basis of fiscal years, since UK firms have different accounting years, and it is necessary to standardise by year for comparison purposes. The fiscal year runs from early April to late March each year, and firms were allocated to the relevant fiscal year by the date of their accounting year-end. A company with an accounting year-end in February 1995 would be allocated to the 1994/95 fiscal year, but a company with a year-end in May 1995 would be allocated to the 1995/96 fiscal year.

One problem in allocating firms to fiscal years was that some firms changed their accounting year-ends during the sample period. There are two types of firms that changed their accounting years: a) those that changed their accounting year to a later date in the accounting year e.g. September 1999 to December 1999; and b) those that changed their accounting year to an earlier date in the accounting year e.g. September 1995 to June 1995. We annualised data where the reported data was for an accounting period different to 12 months.

4. Explanatory variables

a) Firm Size

Total firm assets are used as a proxy for firm size in the regressions since firm size has previously been shown to be the most important determinant in the level of executive compensation. Previous work has typically used total sales as the measure for firm size, but for the banking sector this variable understates the size of the firm, and therefore we use total assets. Market capitalisation is an alternative measure of firm size, but is likely to be correlated with total shareholder return.[3]

b) Firm Performance

The main measure of company performance used is total shareholder return, since the purpose of performance related pay is to align the interests of the directors with those of the shareholders. We also look at alternative accounting measures of performance such as earnings per share, return on assets and growth in sales. Although the past UK research has

[3] When market capitalisation was used as a firm-size proxy in the regression model, the sign on the return variable was negative. The coefficients on both firm-size proxy variables were quite similar with market capitalisation having a slightly smaller value.

found little evidence of relative performance evaluation, we include market and industry adjusted returns.

Total shareholder return was calculated as an annual value by accounting year as opposed to calendar year. Annual returns were calculated for each company by cumulating the standard daily return, defined as the percentage change in close-to-close share price plus the dividend payment on the ex-dividend date. Main et al (1996), and Conyon (1997) calculated annual returns by the log of the change in the return index over the whole year. Instead we follow Barber and Lyon (1997) and compute annual abnormal returns as the buy and hold return (BHAR) minus the buy and hold return on a reference portfolio.

$$BHAR_T = \sum_i \prod_{t=+1}^{T} (1 + R_{it}) - \sum_i \coprod_{t=+1}^{T} (1 + ER_{it}) \qquad (2)$$

The BHAR approach cumulates daily returns on an annual basis to give total shareholder return for the particular account year. Market and industry adjusted returns are the actual return minus the expected return. Expected returns are calculated using a CAPM style model. This runs a regression of the firm's daily return on that of the daily market return

$$R_{it} = \alpha_i + \beta_i \, RFTAll_t + \varepsilon_{it} \qquad (3)$$

The parameters from this regression can be used to calculate expected return i.e. $E(R_{it}) = \alpha_i + \beta_i \, RFTAll_t$ where *RFTAll* is the actual daily return on the FT All Share market index. To obtain the parameter estimates we ran regressions on the daily returns for the year prior to the accounting year. This results in approximately 255 observations in each regression. For the first accounting year, we used in-sample estimates of the coefficients. In the case where firms had changed their accounting years, we estimated the parameters over the full year prior to the new accounting year. The same method is used to obtain expected returns for the industry adjusted returns except regressions are run using the return on the industry index to which the firm belongs. The industry groups are defined in panel A of Appendix 3.

c) Board Composition and Structure

Core and Larcker (1999) suggests that different corporate governance arrangements in firms may influence how much they pay their executives. Fernandes et al (2009) report that CEO pay is positively related to institutional ownership, board size, and fraction of independent directors.

We include two measures of board structure: the total number of directors, and the proportion of the non-executives on the board as a measure of independence. Firms that have more directors (particularly more executive directors) may pay their whole board more simply because they have more directors to pay. A firm may increase total board pay in one year because there are additions to the board rather then any pay increases to the existing members, and this needs to be controlled for. A larger board size may also suggest the firm is more complex hence the need for more (higher quality) directors, who will demand more pay.

Non-executive directors only receive fees for their services, and so are paid considerably less than the executive directors on the board. If there were a greater proportion of non-executives one would expect the total board pay to be less (given board size is kept constant). Also more non-executives may cause directors to be paid less due to greater monitoring. Greenbury (1995) recommended that remuneration committees should comprise solely of non-executive directors. An increase in the proportion of non-executives may reflect this fact and therefore since the non-executives are setting the level of executive pay, pay may be lower.

It is difficult to predict the effect board size and composition would have on the pay of the highest paid director. If there are more directors on the board then the highest paid director may have more responsibility in running a larger possibly more complex board/firm. On the other hand there may be more executives to take on the major roles so the highest paid director has less responsibility and therefore require lower remuneration since all executives in the firm receive similar pay. Cadbury (1992) recommended that roles should be distributed among executives so not one individual has all the power. Again a higher proportion of non-executive directors may imply greater monitoring so directors pay is set at a lower rate. Alternatively if there are few other executive directors the highest paid director may have more roles and responsibility and actually require higher remuneration.

d) Time and Industry Dummies

Time dummies are included to allow for macroeconomic shocks, and a variable for each industry group was created. Conyon and Murphy (2000) used only four categories of industry group: mining and manufacturers, utilities, financial services and other. In the Hemscott dataset industry groups are defined by the ten FTSE Actuaries industry sectors listed in Appendix 3. As can be seen from Panel B of Appendix 3, most firms in the sample are in the cyclical service group, which makes up almost a third of all observations. The least populated sector with only six firms is cyclical consumer goods.

5. Inflation

Since the dataset is a panel over several years, the effects of inflation on the monetary variables needs to be allowed for. All nominal variables were adjusted to 2006 values by the monthly retail price index RPIX, excluding mortgage payments.

IV Overview of Directors Remuneration: Descriptive Statistics

Our sample of 415 firms is an unbalanced panel in that some firms leave the sample before the end and others join midway through. The maximum number of firm-year observations is 4,044 but there may be missing observations for some variables. Panel C in Appendix 2 shows the distribution of the number of observations per firm year. Forty percent of firms (167) are in the sample for the full time-series of 12 years, with only about 10% of firms having less than 6 years worth of data. There were 14 firms that had a fiscal year missing due to a change in account year-ends. There were 18 firms that had an account year that was greater than 12 months and this data had been annualised by Datastream and their returns in our sample were also adjusted.

Table 1 Panel A gives a summary of the pay variables in real terms. The mean of both the total board pay and that of the highest paid director is much greater than the median, suggesting that both pay variables are right skewed with a few firms having unusually large values. The large standard deviations for both pay variables demonstrates there is a wide spread of pay levels across time and between firms in our sample. Figures 1 and 2 shows the levels of average total board real pay and the real pay of the highest paid director across the sample period. These figures show these averages across all industries, and for the financial services sector in particular.

Over the whole period there has been a general rise in the average pay of the board with a slight fall in the 2001/2002 accounting year.[2] The mean total board real pay has risen by 63% and there has been a 50% rise in the median real pay over the sample period, and the mean-median ratio has increased from 1.28 to 1.39. A gap between the median and the mean is likely to be a natural feature of directors pay. As there will a base level of pay necessary to induce participation and high variance and non-negative rewards for performance and managing large firms. This creates a long tail of unusually high pay. That the mean is rising faster than the median suggests this tail is getting longer with pay for these exceptionally high paid individuals or high reward periods rising faster than that for basic salaries (we return to this later). Figure 1 also documents the growth in board pay of those firms in the financial services sector. Both the mean and median pay in the financial services sectors are higher than for all sectors, but there appears to more time-series volatility in the mean total board pay in the financial services sector, and some evidence that this pay appears to lead board pay in other sectors.

In figure 2, again there is a substantial difference in the mean and median of the real pay of the highest paid director. Over the entire period 1994/95 to 2005/06 mean pay of the highest paid director has risen by 122% and median pay by 100% in real terms, with the mean-median ratio increasing from 1.27 to 1.41. It is evident that this widening of the gap between the mean and the median has occurred primarily since 2000. Over the sample period there has been an increase in the average pay of the highest paid director in every year except in 2001/2002 where the mean pay fell slightly. The average pay of the highest paid director has been growing at a faster rate then that of the total board pay. This is reflected in the increase in the ratio of the highest paid director pay to the pay of the total board. In the 1994/95 fiscal year this ratio averaged 24% but by 2005/06 it had risen to 33%. As in Figure 1, it appears that the real pay of the highest paid director in the financial services sector is volatile, and appears to lead executives' pay in other sectors.

Not only are executives getting pay rises well above inflation levels but these are much greater then those of the typical employee in their firm. In our sample on average the average director in a firm earns 12 times more then an average employee in that firm and this ratio has been rising over the sample period (in 1994/95 it was around 9 times and by 2005/06 it was

[2] A similar pattern was found when the pay variables were adjusted for wage growth as opposed to inflation.

15 times). Whilst over the sample the mean board pay has risen by 63% and the highest paid director by 122% the average employee costs has only risen by 11.72% in real terms[4].

Exhibit 2 shows a comparison of pay growth in the mean of the cash compensation for the total board and highest paid director with that of all employees and management pay growth from the Annual Survey of Hours of Earnings (ASHE). ASHE is a representative sample (about 1% of the working population) of employees in the UK, available from 1997 onwards. Exhibit 2 shows that over the period 1997-2006 executive pay has risen much faster than that of managers and senior officials and more then double that of all employees in the UK. The evidence we are documenting is that executive cash compensation has grown considerably during our sample period and by more then any comparable group.

Exhibit 3 shows the distribution of the average real total board pay and the average pay of the highest paid director by ten industry sectors. These sectors are defined in Appendix 3. It can be seen that total board pay is highest in the non-cyclical services sector which includes food and drug retailers, and telecommunications. The financial services sector which includes banks, insurance companies, real estate and financial specialist companies have the second largest total board pay at £3.397 million, and the highest paid single director at £880,770.

Figure 3 shows the percentage change in both pay variables along with the percentage change in the FTSE All Share index for the sample fiscal years 1994/95 to 2005/06. The change in both pay variables appears to follow that of the market index with a slight lag. This may reflect that the largest component of cash compensation, salary, is set at the beginning of the accounting year. Some of the growth in pay over the period may therefore be attributed to the growth in the stock market. This large pay growth over the sample period we have documented may be attributed to the fact that between the 1996 and 1999 fiscal years the stock market grew by 58%. We will explore these issues in more detail in the regression results in Section V below.

[4] The only measure of employee wages obtainable from Datastream is total employee costs. This includes all wages and salaries, social security costs and pension costs of all employees including the directors. Since we know the pay of the directors this can be removed and an average cost per employee can also be worked out since we know the total number of employees and the total number of directors. The only problem is we cannot separate the social security costs (employers national insurance) from the employment costs so this may inflate the average employees wage slightly.

The trend to having a majority of non-executive directors on the board is illustrated in figure 4 and Table 1 Panel D which shows the average composition of a company's' board. On average there are approximately nine members on the board and this has remained fairly constant throughout the time period. However the composition of the board has changed in a subtle way. In the 1994/95 the majority of the board were executives, but by the 2005/06 non-executive directors were in the majority. In 1995 44.5% of a firm's board comprised of non-executive directors but by 2005/06 fiscal year this had risen to over half at 53.6%. The proportion of non-executives on the board seems to be higher in the FTSE 100 companies then the FTSE 250 companies. In the fiscal year of 2005/06 on average 57.1% of board members were non-executives compared to 51.6% in FTSE 250 companies.

These changes probably reflect the impact of the corporate governance reports such as Cadbury (1992) and Greenbury (1995), which highlighted the importance of, and recommended an increase in, the number of non-executive directors. Hampel (1998) recommended that the board should comprise at least a third of non- executives, and Higgs (2003) recommended that at least half the board should be non-executives. From the above evidence it appears this is already the case, particularly in the FTSE 100 companies. Since the average board size has not changed, the evidence in figure 4 suggests that firms have increased the number of non-executives at the expense of executive directors. This would imply that the total board pay should have decreased slightly since non-executives are paid much less then executive directors. Since total board pay has increased the increase in executive pay will be underestimated since this implies that the executives must be receiving a larger increase in pay for the pay of the total board to increase.

Table 1 Panel B reports two measures of firm size: market capitalisation, and total firm assets. The average market capitalisation adjusted for inflation is £3,147.98m with a median of only £659.75m. The mean total assets are £9,201 million with a median of £816 million. Both measures are highly skewed with a few firms being very large. The standard deviations of both size variables suggest there is a large range in firm size. This removes any worries of there being a firm size bias in only using the FTSE 350 firms and suggests that there is plenty of firm size variation.

V Regression Results

A list and description of the variables used in our regressions can be found in Appendix 1. All regressions were performed on both the log of pay of the whole board and that of the highest paid director. First, the firm's raw return is included as the company performance explanatory variable with the inclusion of adjusted return measures later. Following the approach in Murphy (1999) stock market performance variables were entered in the model in the form *ln(1+return),* and total assets were included in log form to reduce the effect of outliers in firm size. Therefore our pay performance estimates are interpreted as elasticities, which is common to the majority of prior studies. In all the regressions the control variables of total assets, number of directors and proportion of non-executives are used. Year dummies are included to allow for any aggregate effects that are not constant over time such as macro economic shocks. Model 1 for both the total board pay in Table 2 and for the highest paid director in Table 3 estimates a pooled regression across firms and time. Industry dummies were included to allow for any possibility of differences across industries, but the only sectors that displayed any significant effects were the Resources, Cyclical Consumer Goods, Utilities and Financial sectors, and the reported regression results only highlight sector dummy variables for these industries. Given the average levels of executive pay in Exhibit 3, surprisingly the coefficients on the financial sector dummies are negative. The interpretation is that financials pay their board 23% less, and their highest paid director 25% less than other industries, once conditioned on other variables. These industry dummies show that the high level of pay in the financial sector can be explained by the other variables in the regression in Model 2, and is mainly due to the large size of companies in the financial services sector as measured by the total assets of the firm: large firms pay high levels of remuneration to their executives.

Fixed effects regressions

Model 2 reports the fixed effects estimates for the total board pay shown in Table 2 and those for the highest paid director in Table 3. An F-test on the significance of the fixed effects that all $\gamma_i=0$ is easily rejected for both dependent variables. We also compare the fixed effects regression model with a random effects model and for both sets of regressions a Hausman[4] test rejects consistent random effects i.e. the unobserved effects are correlated with the explanatory variables so the random effect results will be biased Therefore in interpreting

[4] The test statistic is 27.96 and 23.21 for the Total Board Pay and Highest Paid Director regressions.

the main regression analysis for both dependent variables we will draw on the fixed effects models.

Firm size has a much bigger effect on pay than firm return. In the fixed effects model the total assets' elasticity is around 0.22 for both pay variables which implies a 10% increase in total assets lead to roughly a 2% increase in pay so larger firms pay their boards/top director considerably more. In comparison, shareholder return has a much smaller effect on executive pay. The shareholder return elasticity is slightly stronger for the pay of the highest paid director. The coefficients in Model 2 of Tables 2 and 3, suggest that a 10% increase in shareholder return will lead to a 0.38% increase in total board pay and a 0.68% increase in the pay of the highest paid director. A 10% increase in total assets and total shareholder return translates into a £41,866 and £7.027 increase in total board pay respectively at the median level of total board pay of £1,864,005. In the case of the pay of the highest paid director a 10% increase in total assets and total shareholder return translates into a £11.815 and a £3,726 increase in highest paid director pay at the median level of £543,200. Clearly executive pay is more sensitive to firm size than firm performance. The shareholder return estimates for the highest paid director are comparable to Conyon (1997) and Benito and Conyon (1999), but lower than Conyon and Murphy (2000). Our estimates for total board pay are lower then Main et al (1996), who found estimates of around of 0.15 but this may reflect that their study only used a cross section of 60 large FTSE 100 firms.

The coefficients for the time dummies in the basic fixed effects regression, although not reported in Tables 2 and 3, are shown in Exhibit 4. All of the year dummy variables are positive and mostly significant relative to the 1994/95 fiscal year and the effect seems to get larger as time progresses. This implies that base executive pay, unrelated to company performance or firm size, has been rising through time at well above inflation or employee earnings, as illustrated in Figures 1 and 2.

The time variables will be picking up any factors that change over time but are the same across all firms. Even after allowing for firm size and firm performance the growth in average total board pay has grown by 63% and that of the highest paid director has grown by 122%. This highlights that much of the growth in directors' pay can not be attributed to the individual firms' performance, and suggests that corporate governance reports that have emphasised aligning executive pay with performance, have been ineffective.

In Model 3 we interacted an industry dummy for the different sectors with the performance measure, *ln(1+firm return)* to see whether pay-performance sensitivity differed across industries. We anticipated finding that pay-performance would be more sensitive in the financial sector than other industries. However in the financial services sector, for the two measures of executive pay, although pay-performance elasticities are higher than in the remaining industries, these differences are not significant. Although in the case of the real pay of the highest paid director, they are significantly higher at the 1 per cent level for the Cyclical Consumer Goods sector.

As might be expected the number of directors on the board, also reflecting firm size, has a positive effect on the total board pay since there are more (and possibly higher quality) directors to pay. From the coefficients in Model 2 of Table 2, an increase in the board size by one director will increase total board pay by 5.8%. From Table 3, the number of directors has a positive but insignificant effect on the pay of the highest paid director.

The proportion of non-executive directors has opposite effects on the total board pay and the highest paid director pay, though for the latter it is insignificant for the fixed effects models. As the proportion of non-executive directors increases the total pay of the board goes down. From Table 2 a 1% increase in the proportion of non-executives will reduce total board pay by 0.58%. This may be simply because non-executives are paid less since they only receive directors' fees so if there are a higher number of non-executives then overall pay will be less (holding board size constant). On the other hand, the proportion of non-executives may be a proxy for the level of monitoring exerted by the board, so more monitoring (more non-executives) will lower total board pay. If this was the case, we might expect the proportion of non-executives to have a negative effect on the pay of the highest paid director. In Table 3, the effect is positive although insignificant. These results suggest that the size of the board and the composition of the board do not affect the level of pay for the highest paid director but do affect the pay of the whole board.

We now turn to the effect of firm risk on the pay-performance relationship. Aggarwal and Samwick (1999) and Garvey and Milbourn (2003) found that riskier firms tend to have lower pay-performance relationships and a smaller proportion of their pay as incentive based pay. Since we have only data on cash compensation we can't directly test the latter but we can look at the former. The firm return was interacted with the cumulative density function of the firm's variance of returns, as our measure of firm risk. For each firm, the variance of daily returns for the previous account year was computed, except in the case of the first year where that years data was used. These variances were then normalised using a cumulative density function (CDF). This enabled each firm to have a value between 0 and 1 so the firm with the most risk would have a CDF equal to 1.

The coefficients on firm return and firm return interacted with the CDF are shown in Model 4, of Tables 2 and 3. The CDF of firm risk is negative but insignificant in the fixed effects regression for both dependent variables, implying that the level of firm risk having no significant effect on the level of cash compensation. When we include the interactive total shareholder return variable with CDF of firm risk the pay performance relationship changes slightly.[5] The coefficient on the *ln(1+return)* is the pay performance relationship for a firm with no risk. If we know where the firm lies in the return distribution then we can work out their pay performance relationship using the sum of the two coefficients. From the coefficients in the raw return fixed effects regression model a firm with no risk (CDF=0), has a pay performance estimate of 0.1184, so that a 10% increase in total shareholder return will lead to a 1.18% increase in total board cash compensation. The coefficient on the interactive variable is –0.0956, so for a firm with the highest level of risk (CDF=1) their pay performance estimate would be 0.1184-0.0956 = 0.0228. For a firm that had the median level of risk (CDF=0.5) their pay performance elasticity would be 0.1184-(0.5*0.0956) = 0.0706. This demonstrates that firms with a higher level of risk tend to have lower pay performance relationships, as has been found previously.

In an attempt to correct for the endogeneity that if pay induces effort and effort produces performance leading to overstated performance-pay coefficients, we also estimate the model using GMM estimators. In Model 6 the performance coefficient of the board pay regression remains similar at 0.0374, but the effect of total assets is reduced from 0.2246 to 0.1234, but this may reflect that lagged total board pay is included in the regression and total assets in the other regressions will be picking up the persistence of pay. As would be expected the GMM regression shows that there is some persistence in pay. The GMM regression coefficient in

[5] Including an interaction of firm risk and performance has a high correlation with the performance variable of 0.94, but the other coefficients are stable with respect to the inclusion of this variable

Model 6 on firm return is very similar to that from the fixed effects regression. In both Tables 2 and 3 the Hansen test rejected the null of invalid instruments for the GMM models.

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Alternative measures of returns[6]

We have seen that the raw firm return does have a large effect on directors pay. But firms may do well because the whole market/industry is performing well. Therefore Model 5 in Tables 2 and 3 reports the use of market adjusted returns, in which a CAPM estimate of expected returns is deducted from the raw return. If the market/industry is rising, do firms take this into account before setting pay levels? Is executive compensation related to the out-performance of the firm relative to the market or industry? For both pay variables it seems that market adjusted returns makes very little difference to the significance, sign and size of the return coefficients. In unreported results we found that industry adjusted return has a slightly larger effect but only makes a marginal difference. In comparison with the earlier reported numbers, a 10% increase in total return above the market return from Model 5 increases total board pay by £6,766. Using similar information from Table 3, if return is greater then the market by 10%, the median highest paid director pay will increase by £3,634. These estimates would suggest that firms do not make use of relative performance evaluation.

Interactive Dummy Variables

Our fixed effects estimates in Tables 2 and 3 are an average across time and companies. Any estimated pay-performance relationship will only be an average, but the pay-performance relationship may vary across firms, time or industries or other factors. By including a set of interactive variables we may allow for the pay-performance relationship to vary across those variables. The inclusion of the firm return variable interacted with the year dummy variables allows us to see if the pay-performance relationship has changed over time for both pay variables. The raw return firm variable was interacted with the year dummies in the regression along with the usual control variables and a full set of year dummies.

Figure 5 shows how the pay-performance relationship has changed over the sample period using the estimates of the coefficients of the interactive dummy variables. One might have expected that the pay-performance relationship would have increased over the sample period for both pay variables, following the proposals of the corporate governance reports suggesting pay and performance be linked more closely. Over the whole sample period the pay-performance elasticity it is possible to discern a slight rising trend for both pay variables, although the time series movement is volatile. For the total board it has risen from 0.02 in 1995 to 0.106 in 2006 and for the highest paid director it has risen from 0.034 to 0.288. There appears to be a pattern that elasticities are increasing when the stock market is rising, but a weaker relationship between pay and performance when stock prices are falling. F-tests on the differences in these pay-performance elasticities were F(11, 3205)=0.78, and F(11, 3201)=1.10 for total pay and highest paid director respectively, and hence we cannot reject the null hypothesis that all of these coefficients are equal.

We may also examine how the pay size relationship has changed over time. Interactive dummy variables of sales and year dummies were included in the regression. Figure 6 shows the pay size elasticities over the sample period. The pay size relationship has fluctuated around a mean of about 0.22 for both pay variables. In the 1994/95 fiscal year the pay size elasticity was 0.228 and 0.208 for total pay and that of the highest paid director respectively. By 2005/06 they had risen to 0.234 and 0.241 respectively. F-tests for the equality of the pay-size elasticities coefficients are F(11, 3205)=1.54 for the total board pay and F(11, 3201)=1.21 for the pay of the highest paid director. This evidence suggests that there is no significant trend over time for the pay-size sensitivity for either pay measure. Murphy (1999) reports that the pay size relationship had fallen for executive compensation in the US.

We also examined how the pay-performance relationship varied across different categories. For variables that varied across time, interactive variables were included in the basic fixed effect regressions. Table 4 shows the effect of interactive dummy variables, that varied across time. If directors are rewarded through a combination of of base pay which is unrelated to performance plus performance related bonuses which can only be positive then you will naturally see pay being sensitive to exceptionally good performance but not exceptionally bad performance. This pattern will lead to pooled estimates we have estimated above to somewhat mask the full extent of rewards to exceptionally good performance. On the other hand such one-sided risks can lead to high risk taking as poor performance is not punished to the same degree as good performance is rewarded. There was some suggestion of this in figure 3. This was tested by interacting the firm return variable with whether firms

[6] We also used different measures of performance, namely accounting based methods such a s change in real

were below or above the median return of the sample firms in each fiscal year. For both pay variables there does seem to be a difference between firms below and above median firm return. The pay-performance relationship is significant for firms above median return but insignificant for those below. For firms above the median return the average pay-performance relationship is 0.0465 for the total board pay and 0.0968 for the highest paid director. These estimates are higher then the average pay-performance relationships found in the original fixed effect regressions. Although not reported results were similar when the return was interacted with whether firms are above or below the return on the FTSE All Share index in the given fiscal year. We also differentiated between the financial services sector and all other sectors, and it appears that this difference between pay-performance elasticities for above the median and below the median firms are more pronounced for firms in the financial services sector. Although an F-test on the equality of these coefficients could not be rejected.

Next, the firm return was interacted with whether the fiscal year was during the bull market up to March 2000, the subsequent bear market up to 2003, and the bull market since 2004. The pay-performance relationship was stronger for both pay variables during the bear market fall. This suggests that firms were receiving pay based on the performance of the whole market when the market was booming, and then based on their own performance after the stock market crashed. An alternative explanation would be that firms are under more pressure to comply with the corporate governance reports when the stock market is in decline.

The third set of interactive variables look at the size of firms, split into whether the firms were above or below median total assets in the particular fiscal year. There appears to be a stronger pay-performance relationship for larger firms than smaller firms. However this is not the case for firms in the financial services sector, where the pay-performance relationship for total board pay is stronger for firms below median assets.

VI Conclusions

The objective of this paper has been to examine the determinants of total board pay and the pay of the highest paid director, how this relationship has changed over time, and whether there is any evidence that executive remuneration packages in the financial services sector,

sales, return on assets, real net EPS; but all these variables were insignificant might have contributed to the global financial crisis of 2007/08. We argued that if remuneration structures in financial firms were responsible for the crisis, then the pay-performance relationship between executive pay and short-term profits should be much greater than in other sectors. Our pay measures comprised salary and non-equity bonuses, and according to Fernandes et al (2009) these components typically constitute around seventy five per cent of UK executive's pay packages. Still, a caveat to our results is that our pay variables did not include equity incentive payments, but given the increase in cash compensation over the period of study, it seems relevant to examine whether there is any link between the cash pay of executives and the performance of the company, during a time of extreme stock price volatility and against a back-drop of a series of changes to corporate governance mechanisms. Following the financial crisis, regulators have been searching to identify an appropriate regulatory structure to monitor non-equity incentives as a component of executive pay. For example, Recommendation 33 of the Walker Report (2009a) proposes that half of the value of incentive payments to executives should only be vested after between three and five years.

Our main findings are that firm size has a dominant effect in determining the level of executive compensation. Surprisingly we found that although total board pay and the pay of the highest paid director was relatively high in the financial sector, there was no significant difference in the pay-performance sensitivities between the financial sector and other industries. The primary determinant of executive pay appears to be firm size. It has been argued that remuneration packages in the financial services sector may have been partly responsible for the global financial crisis. It would appear that the mechanism for such an impact is not through the relationship between executive pay and stock market performance, but instead through the incentive for executives to ensure that their firm's assets are as large as possible. Of course it could be argued that the experience of the financial crisis has shown that banks in particular are so important to the functioning of the global economy, that compensation packages should be less sensitive to performance than for non-financial firms.

Following the adoption of a series of corporate governance reforms throughout the 'nineties we expected to find an increase in these pay-performance elasticities over time, since a common theme in these reforms was that executive pay should be related to company performance. However we found little evidence of an upward trend in pay-performance sensitivities, but we did identify an asymmetric relationship, in that pay-performance elasticities were high when stock returns were high, but that pay was less sensitive to performance when stock returns were low. This follows if executives are paid a base salary unrelated to performance, plus bonuses, which are related to above average performance and can only be positive. This one sided risk model creates an asymmetry in the pay-performance link which might potentially encourage excessive risk taking by executives in all sectors. Our results suggests that there is a stronger relationship between executive cash pay and company performance for exceptional performance but not exceptional under-performance.

Table 1: Descriptive statistics

This table reports summary statistics (mean, median and standard deviation) of the variables used in our analysis. Panel A reports the two definitions of executive compensation: total board pay and pay of the highest paid director in £000s per accounting year; Panel B reports two measure of firm size: market capitalization and total assets, both in £ million; Panel C reports measures of firm performance, including the buy-and-hold raw return, and the CAPM adjusted excess return (from equation (3); the net earnings per share, and the return on assets; Panel D reports a number of corporate governance measures, including the total number of directors on the board, and the split between the number of executive and non-executive directors. For further definitions of all variables see Appendix 1. All monetary variables are adjusted to 2005/06 fiscal year prices

Panel A: Pay Variables

Variable	No of Obs	Mean	Std.Dev	Median
Real Total Board Pay (£'000)	3,271	2,528.92	2,188.80	1,864.01
Real Highest Paid Director Pay (£'000)	3,715	733.79	721.08	543.20

Panel B: Firm Size Variables

Variable	No of Obs	Mean	Std.Dev	Median
Real Market Capitalisation (£m)	2,859	3,147.98	9,892.75	659.75
Total Assets (£m)	3,690	9,201.20	4.44e+04	816.4

Panel C: Performance Variables

Variable	No of Obs	Mean	Std.Dev	Median
Firm Return	3,703	0.1694	0.7110	0.0927
CAPM Adjusted Firm Excess Return	3,698	0.1185	0.6975	0.0390
Real Net EPS (pence)	3,688	16.27	155.79	17.15
Real Return on Assets	3,690	0.0613	0.1877	0.0708

Panel D: Board Structure

Variable	No of Obs	Mean	Std.Dev	Median
No of Directors	3,719	9.48	2.89	9
No of Executive Directors	3,702	4.61	1.89	4
No of Non-Executive Directors	3,702	4.86	2.11	4
Proportion of Non-Executives (%)	3,702	0.51	0.14	0.5

Table 2: Total Board Pay Regressions

Table shows results of the pay-performance regression in equation (1) where the dependent variable is ln(Total Board Pay). Explanatory variables include: the ln(Total Assets) measured in £millions; ln (1+firm return), with firm raw return calculated as buy-and-hold returns in equation (2); market adjusted return includes a CAPM adjustment to the buy-and-hold returns in equation (3);% of non-executives is fraction of board who are non-executive directors; No of Directors is total number of executive and non-executive directors on Board; and CDF Firm Risk is measure of riskiness of firm. All monetary variables are inflated to 2006 prices using the RPIX. Standard errors (in brackets) calculated using the Huber-White-Sandwich estimator which adjusts for correlation within a firm; * denotes significant at 5%; ** denotes significant at 1%; Time dummies are included but not reported; Industry dummies for 9 sectors are included but only reported when relevant; reference sector is Cyclical Services.

	OLS Pooled (1)	**Fixed Effects (2)**	**FE with industry interaction and firm return (3)**	**FE with Firm Risk (4)**	**FE with CAPM-returns (5)**	**GMM (6)**
ln(Total Assets)	0.2206	0.2246	0.2239	0.223	0.2237	0.1234
	[0.007]**	[0.026]**	[0.026]**	[0.022]**	[0.026]**	[0.016]**
ln(1+firm return)	0.0243	0.0377	0.0377	0.1184		0.0374
	[0.033]	[0.013]**	[0.022]	[0.038]**		[0.014]**
ln(1+adjusted return)					0.0363	
					[0.013]**	
% of non-executives	-0.8979	-0.5839	-0.5856	-0.5034	-0.5779	-0.6563
	[0.060]**	[0.094]**	[0.094]**	[0.101]**	[0.093]**	[0.087]**
No of Directors	0.0862	0.0585	0.0587	0.0597	0.059	0.0591
	[0.004]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.008]**
lag total board pay						0.3357
						[0.055]**
CDF Firm Risk				-0.0131		
				[0.032]		
CDF Firm Risk* ln (1 + firm return)				-0.0956		
				[0.048]*		
Industry effects:	Intercept dummy:		Industry dummy* ln(1 + firm return):			
Resources	-0.1252		0.0023			
	[0.038]**		[0.052]			
Cyclical Consumer	0.212		0.097			
	[0.052]**		[0.099]			
Non-cyclical Services			-0.0773			
			[0.045]			
Utilities	-0.4592		0.1616			
	[0.032]**		[0.098]			
Financials	-0.2329		0.0603			
	[0.030]**		[0.045]			
Constant	4.0264	4.0264	4.041	4.0148	4.0336	3.2868
	[0.081]**	[0.081]**	[0.330]**	[0.273]**	[0.332]**	[0.266]**
Observations	3,643	3,643	3,643	3,074	3,636	3,221
Hansen Test Invalid Insts						69.32
F-test $\gamma_i = 0$		F(411,3216)=15.1	F(411,3207)=15.1	F(411, 2647)=13.4	F(411, 3209)=15.1	
R-squared	0.634	0.406	0.409	0.386	0.406	
Number of firms		412	412	412	412	412

Table 3: Highest Paid Director Regressions

Table shows results of the pay-performance regression in equation (1) where the dependent variable is ln(Highest Paid Director). Explanatory variables include: the ln(Total Assets) measured in £millions; ln (1+firm return), with firm raw return calculated as buy-and-hold returns in equation (2); market adjusted return includes a CAPM adjustment to the buy-and-hold returns in equation (3);% of non-executives is fraction of board who are non-executive directors; No of Directors is total number of executive and non-executive directors on Board; and CDF Firm Risk is measure of riskiness of firm. All monetary variables are inflated to 2006 prices using the RPIX. Standard errors (in brackets) calculated using the Huber-White-Sandwich estimator which adjusts for correlation within a firm; * denotes significant at 5%; ** denotes significant at 1%; Time dummies are included but not reported; Industry dummies for 9 sectors are included but only reported when relevant; reference sector is Cyclical Services.

	OLS Pooled (1)	**Fixed Effects (2)**	**FE with industry interaction and firm return (3)**	**FE with Firm Risk (4)**	**FE with CAPM-returns (5)**	**GMM (6)**
ln(Total Assets)	0.2152	0.2175	0.2171	0.2177	0.2162	0.1192
	[0.008]**	[0.025]**	[0.024]**	[0.022]**	[0.024]**	[0.021]**
ln(1+firm return)	0.0732	0.0686	0.0867	0.1364		0.0648
	[0.036]*	[0.016]**	[0.019]**	[0.043]**		[0.018]**
ln(1+adjusted return)					0.0669	
					[0.015]**	
% of non-executives	0.2107	0.1212	0.1224	0.1583	0.1329	0.3856
	[0.071]**	[0.106]	[0.105]	[0.116]	[0.104]	[0.121]**
No of Directors	0.0222	-0.0025	-0.0023	-0.0022	-0.0019	-0.0099
	[0.005]**	[0.006]	[0.006]	[0.006]	[0.006]	[0.013]
lag total board pay						0.3574
						[0.068]**
CDF Firm Risk				-0.0169		
				[0.037]		
CDF Firm Risk* ln (1 + firm return)				-0.0898		
				[0.057]		
Industry effects:	**Intercept dummy:**		**Industry dummy* ln(1 + firm return):**			
Resources	-0.1753		0.0091			
	[0.045]**		[0.077]			
Cyclical Consumer	0.2354		0.1356			
	[0.064]**		[0.045]**			
Non-cyclical Services			-0.115			
			[0.064]			
Utilities	-0.6006		0.2302			
	[0.038]**		[0.120]			
Financials	-0.2500		0.0239			
	[0.033]**		[0.049]			
Constant	2.8502	3.0228	3.027	3.0099	3.0247	2.1213
	[0.090]**	[0.305]**	[0.303]**	[0.269]**	[0.305]**	[0.341]**
Observations	3,639	3,639	3,639	3,071	3,632	3,219
Hansen Test Invalid Insts						65.51
F-test all γ_i=0		F(411,3212)=13.8	F(411,3203)=13.8	F(411, 2644)=12.6	F(411, 3205)=13.7	
R-squared	0.458	0.344	0.348	0.311	0.346	
Number of firms		412	412	412	412	412

Table 4: Coefficients on interactive return variables, by median

Table shows the effect of interactive dummy variables that vary across time. Panel A splits estimated pay-performance elasticities across firms with above and below median returns in any fiscal year, and by financial and non-financial sectors; Panel B splits estimated pay-performance elasticities across years 1994-200; 2001-2003; 2004-2006, and by financial and non-financial sectors; Panel C splits estimated pay-performance elasticities across firms with above and below median size in any fiscal year, and by financial and non-financial sectors.

Variable interacted with firm return	**Total Board Pay**	**Highest paid Director**
Panel A: Firm return		
Firms with return above median return in fiscal year (All sectors excl. Financial)	0.0465 [0.020]*	0.0968 [0.024]**
Firms with return below median return in fiscal year (All sectors excl Financial)	0.0205 [0.019]	0.0372 [0.022]
Equality of coeffs	F(1,2748)=0.69	F(1,2746)=2.53
Firms with return above median return in fiscal year (Financial Sector)	0.1594 [0.068]*	0.1962 [0.080]*
Firms with return below median return in fiscal year (Financial Sector)	0.0891 [0.075]	0.0686 [0.088]
Equality of coeffs	F(1,451)=0.4	F(1,449)=0.95
Panel B: Stock Market Performance		
Bull market performance fiscal year<2001 (All sectors excl. Financial)	0.0289 [0.018]	0.0658 [0.021]**
Bear market performance fiscal year>2000 & <2003 (All sectors excl. Financial)	0.0482 [0.022]*	0.0608 [0.026]*
Bull market performance fiscal year>2003 (All sectors excl. Financial)	0.0206 [0.023]	0.0689 [0.028]*
Equality of coeffs	F(2,2747)=0.41	F(2,2745)=0.02
Bull market performance fiscal year<2001 (Financial Sector)	0.1118 [0.068]	0.0937 [0.080]
Bear market performance fiscal year>2000 & <2003 (Financial Sector)	0.2258 [0.075]**	0.208 [0.088]*
Bull market performance fiscal year>2003 (Financial Sector)	-0.0052 [0.101]	0.1125 [0.119]
Equality of coeffs	F(2. 450)=1.81	F(2, 448)=0.51
Panel C: Firm Size		
Firms above median assets (All Sectors excl. Financial)	0.0512 [0.021]*	0.0988 [0.025]**
Firms below median assets (All Sectors excl. Financial)	0.0263 [0.013]*	0.0535 [0.016]**
Equality of coeffs	F(1,2748)=1.29	F(1,2746)=2.51
Firms above median assets (Financial)	0.0947 [0.063]	0.0988 [0.025]**
Firms below median assets (Financial)	0.1518 [0.056]**	0.0535 [0.016]**
Equality of coeffs	F(1,453)=0.53	F(1,451)=1.83

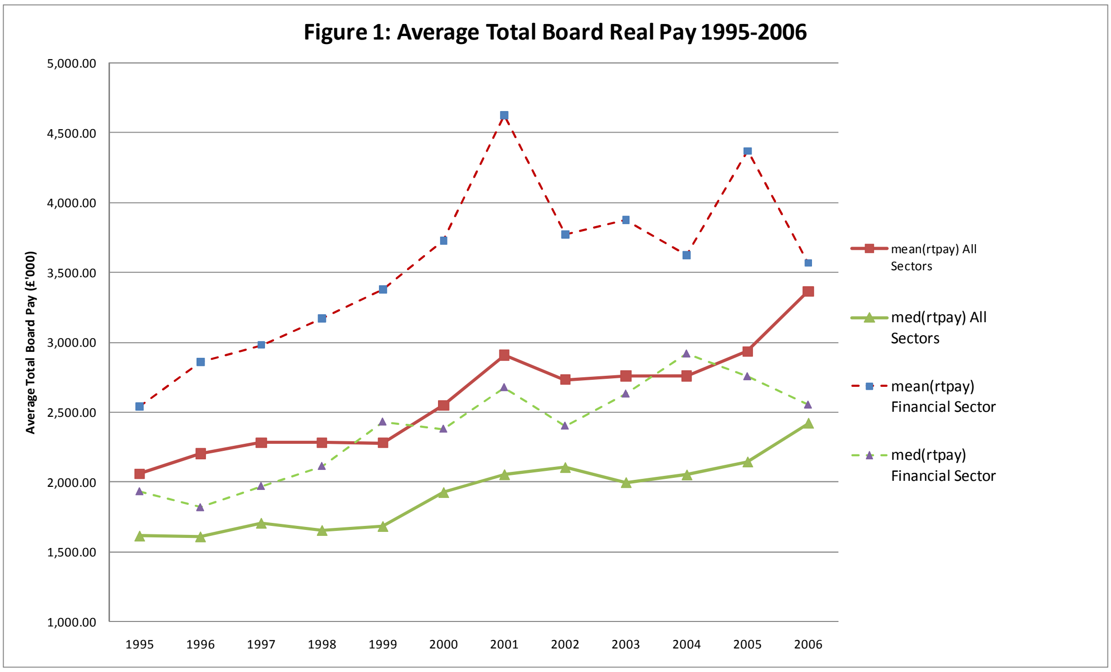

Fig. 1. Average real total board pay 1994/95-2005/06; Pay is cash compensation (salary, bonus and pension contributions) and is adjusted to 2005/06 fiscal year prices.

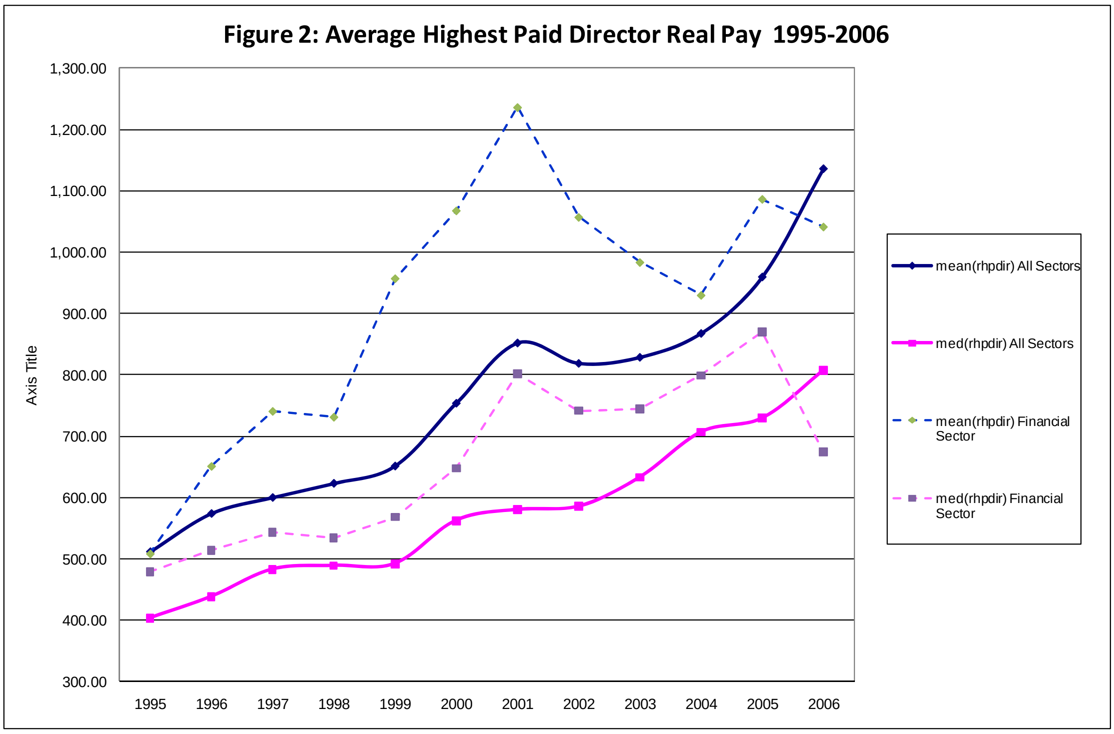

Fig. 2. Average real pay of highest paid director 1994/95-2005/06; Pay is cash compensation (salary, bonus and pension contributions) and is adjusted to 2005/06 fiscal year prices.

Exhibit 1: Comparison of the use of Incentive and Non-Incentive pay in the Banking and Non-Banking Sectors between years 2000 and 2006

Company	Year 2000				Year 2006			
	Total comp (£m in 2000)	All non-Incent pay/TC	Non-equity Incent pay/TC	Equity Incent pay/TC	Total comp (£m in 2006)	All non-Incent pay/TC	Non-equity Incent pay/TC	Equity Incent pay/TC
Panel A: Total Board Pay, Banks								
Barclays	12,827	26.3%	9.8%	63.8%	44,380	13.3%	38.2%	48.5%
HSBC	10,489	50.8%	24.2%	24.9%	15,136	38.6%	23.6%	37.9%
Lloyds	9,119	43.7%	14.4%	41.9%	26,787	21.5%	19.8%	58.7%
RBS	14,716	28.9%	23.6%	47.4%	30,391	32.2%	34.0%	33.8%
Average		37.4%	18.0%	44.5%		26.4%	28.9%	44.7%
Panel B: Total Board Pay, non-Banks								
Glaxo	16,723	24.0%	13.0%	62.9%	20,341	12.8%	11.1%	76.1%
Hanson	4,201	53.2%	10.4%	36.5%	4,049	41.0%	16.6%	42.4%
Marks&Spencers	14,081	21.9%	0.4%	77.7%	8,023	27.3%	20.5%	52.2%
Wolsey	4,688	74.5%	20.9%	4.6%	14,396	33.3%	26.1%	40.6%
Average		42.2%	12.6%	45.2%		28.2%	20.6%	51.2%

Total compensation and components of total compensation for total Board Pay for two years: 2000 and 2006. Components of total compensation include: All non-incentive pay (salaries and pension contributions); Non-equity incentive pay (bonuses); and Equity incentive pay (options and LTIPS)
Source: BoardEx

Exhibit 2: Growth in Nominal Pay Across Executives, Managers and All Employees 1997-2006

Pay Group	Annualised Nominal Mean Pay Growth 1997-2006	Total Nominal Mean Pay Growth 1997-2006
Total Board Pay	6.77%	80.41%
Highest Paid Director	9.79%	131.78%
Managers and Senior Officials	4.63%	50.26%
All Employees	3.92%	41.38%

Comparison of growth in mean real cash compensation of the total board and highest paid director with managers and all employees from Annual Survey of Hours and Earnings (ASHES).
Source: Datastream and www.statistics.gov.uk.

Exhibit 3: Real Total Board Pay and Pay Highest Paid Director, by Industry

Industry Code	Industry Group	Total Pay (£'000)	Rank	Highest Paid Director (£'000)	Rank
1	Resources	3,321.20	3	890.09	3
2	Basic Industries	2,325.13	6	652.49	7
3	General Industrials	1,973.73	9	617.62	8
4	Cyclical Consumer Goods	2,567.39	5	792.16	5
5	Non-cyclical Con. Goods	2,787.18	4	805.41	4
6	Cyclical Service	2,269.45	7	723.34	6
7	Non-cyclical Services	3,848.35	1	954.92	1
8	Utilities	2,002.92	8	570.31	9
9	Financials	3,544.80	2	915.88	2
10	Information Technology	1,383.58	10	439.32	10
Total		2,528.92		733.79	

Real total board pay and pay of highest paid director by ten broad industry groups.

Exhibit 4: Time Dummy coefficients

Fiscal Year	Total Board Pay	Highest Paid Director Pay
1995/96	0.0239	0.0703
	[0.023]	[0.028]*
1996/97	0.0792	0.1324
	[0.023]**	[0.027]**
1997/98	0.101	0.1909
	[0.023]**	[0.028]**
1998/99	0.1037	0.1965
	[0.023]**	[0.028]**
1999/00	0.1787	0.2889
	[0.024]**	[0.029]**
2000/01	0.2404	0.3487
	[0.025]**	[0.030]**
2001/02	0.2745	0.3906
	[0.025]**	[0.030]**
2002/03	0.3176	0.4588
	[0.026]**	[0.031]**
2003/04	0.3117	0.4382
	[0.027]**	[0.032]**
2004/05	0.3663	0.5145
	[0.027]**	[0.033]**
2005/06	0.3999	0.5989
	[0.041]**	[0.049]**

Time dummy coefficients from fixed effects regression model (2) in Table 2 and Table 3. Year 1994/95 is the reference year. Standard errors in brackets

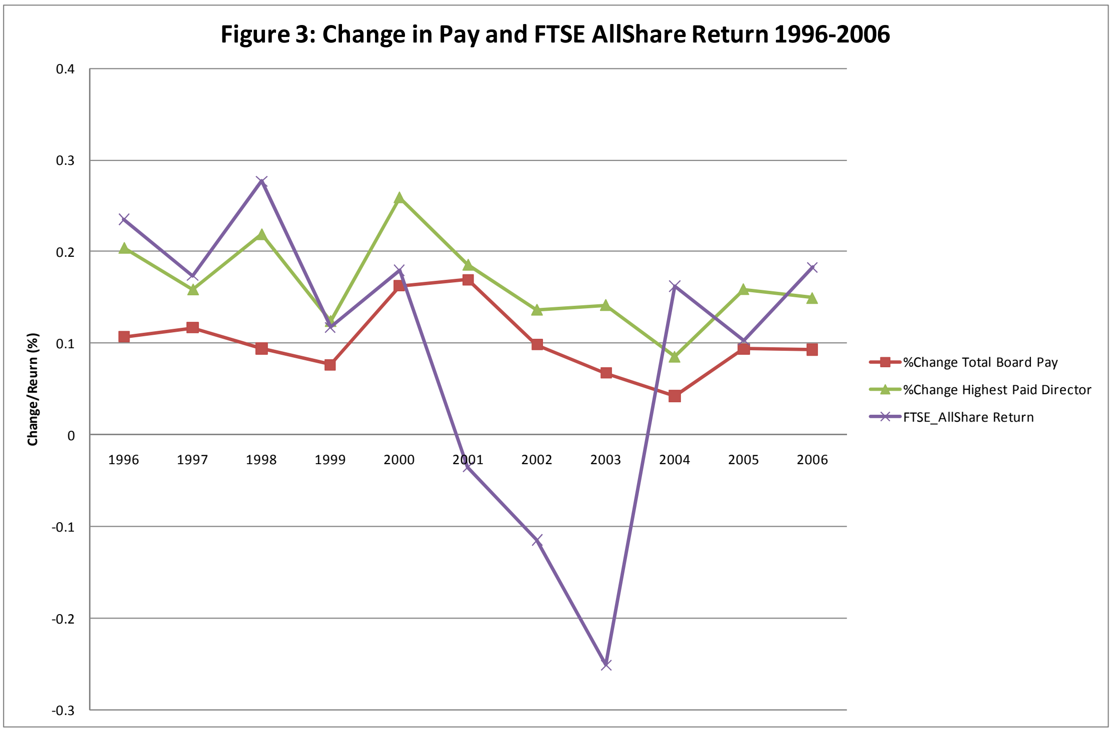

Fig. 3. A comparison of the percentage changes in both pay variables and the total return of the FTSE All Share index 1995/96-2005/06, pay is cash compensation (salary, bonus and pension contributions) and is adjusted to 2001/02 fiscal year prices.

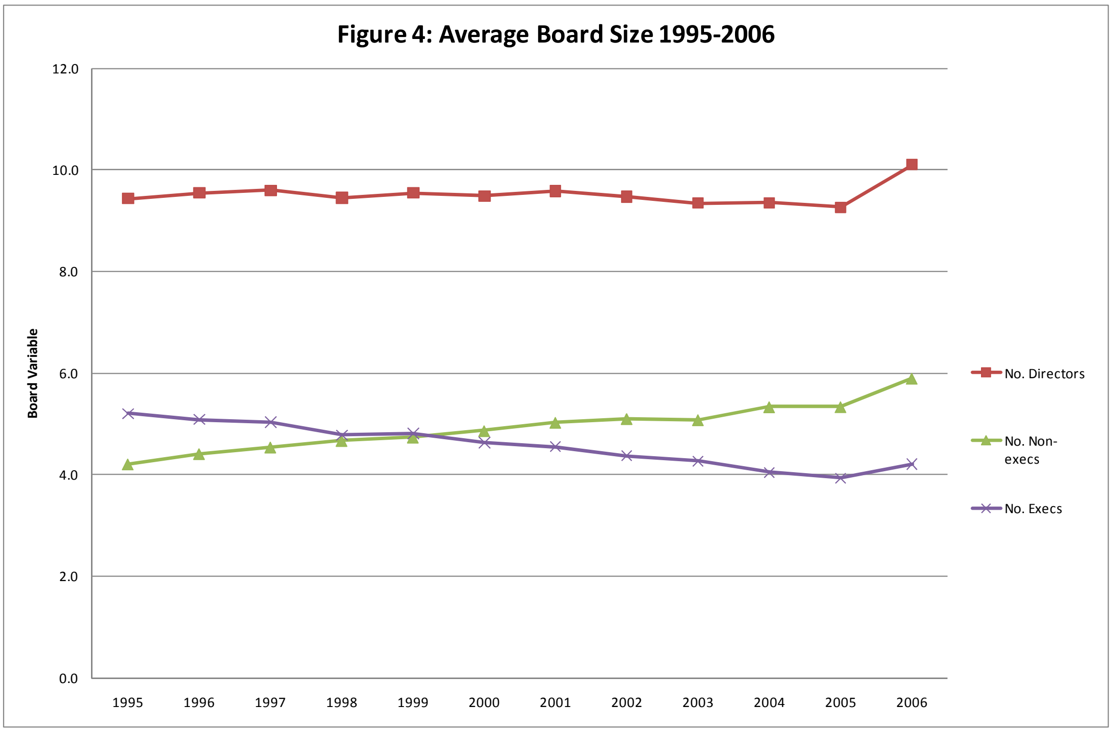

Fig. 4. Average board size, number of executives and number of non-executives 1994/95-2005/06.

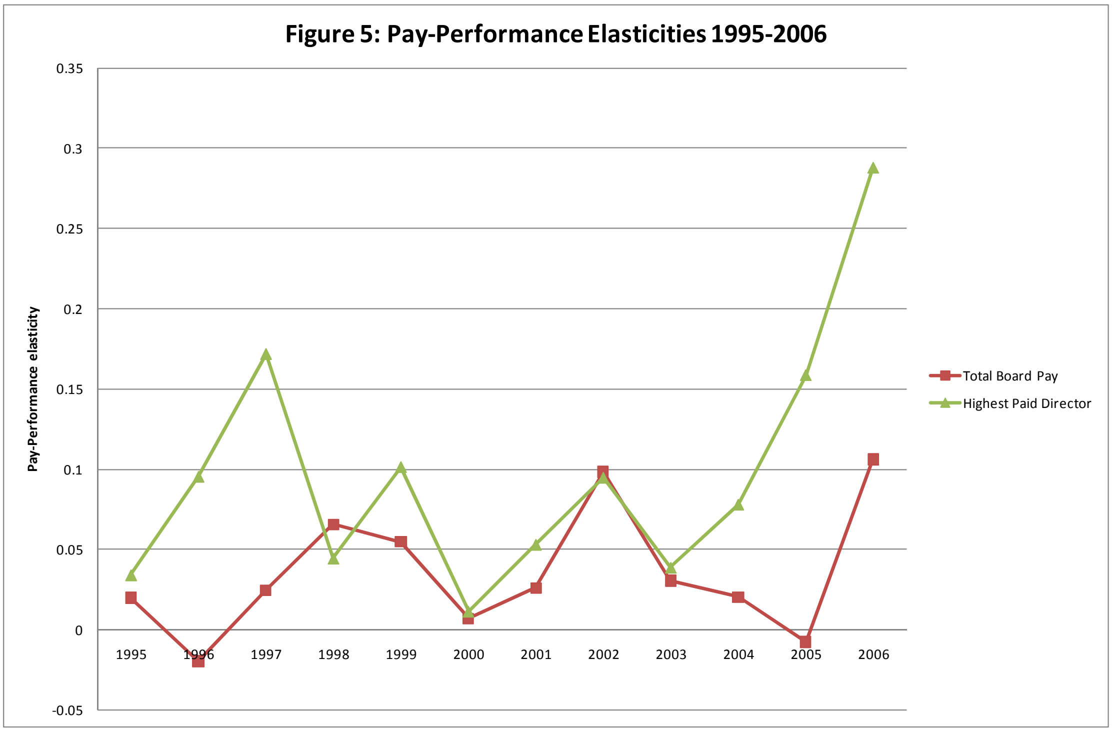

Fig. 5. Pay performance elasticities 1994/1995-2005/06 obtained from fixed effects regressions.. Pay is cash compensation (salary and bonuses) and is adjusted to 2005/06 fiscal year prices. Performance is measured by total shareholder return.

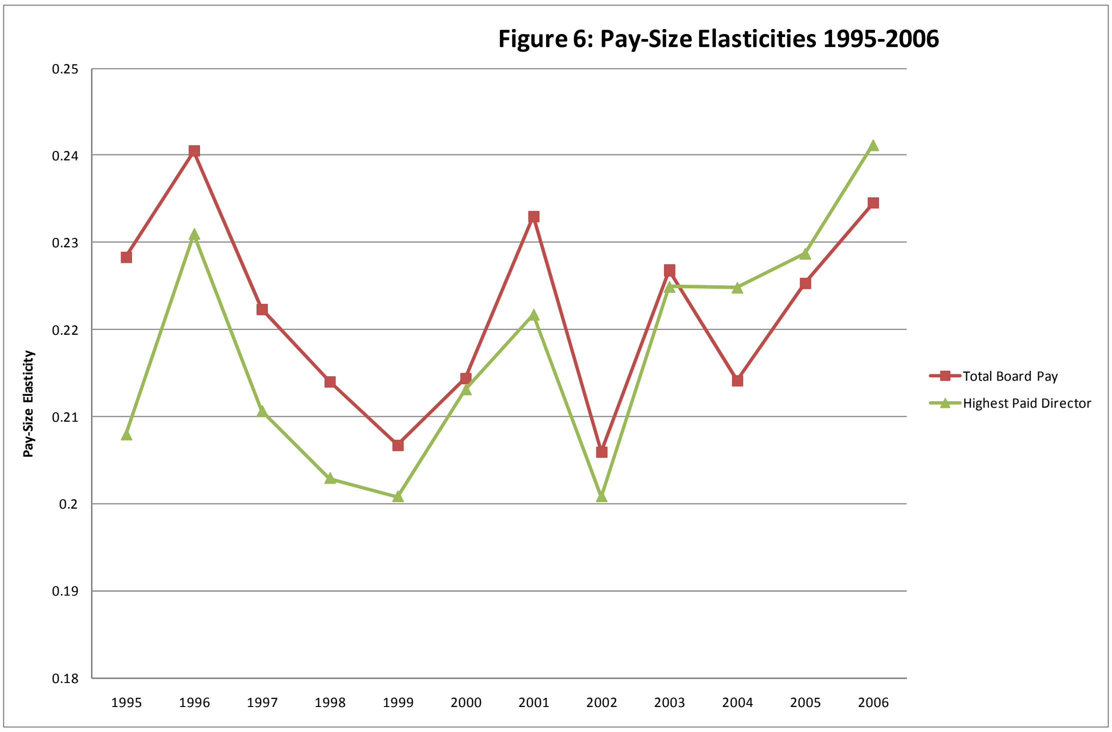

Fig 6. Pay size elasticities 1994/95-2001/06 obtained from fixed effects regressions. Pay is cash compensation (salary and bonuses) and size is measured by total assets. Both pay and assets are adjusted to 2005/06 fiscal year prices.

Appendix 1: List of Variables

Accounting Year	Individual firms accounting year as given by the year ends from Datastream
Fiscal Year 1995-2006	Set of fiscal years which firm's account year is matched up with - used as year dummy variables in regressions
FTSE Index	Index that company was constituent of at the end of the firm's accounting year - FTSE 100, FTSE 250, FTSE small cap, FTSE fledgling or FTSE aim
Indgroup1-10	A set of 10 sector groups defined in Appendix 3
Market Capitalisation	Market capitalisation of the firm at the end of the accounting year – £m (source: Hemscott trading dataset)
Total Assets	Total assets of firm – £'000 (Datastream code 392)
Total Board Pay	Total pay of all directors of the firm board -£'000 (Datastream code 126)
Highest Paid Director Pay	Remuneration of the highest paid director -£'000 (Datastream code 244)
Firm Return	Individual firm's rawstock market return by accounting year (source: Hemscott trading dataset)
FTSE All Share	Value of the FTSE All share index (Datastream)
FTSE All Share Return	Total annual return of FTSE All share index by firm's accounting year (Datastream)
Firm market adjusted return	Firm's abnormal return for its accounting year using expected returns from CAPM model - explained in section 3b
Firm industry adjusted return	Firm's abnormal return for its accounting year using expected returns from Industry CAPM model - explained in section 3b
No of Directors	Total number of directors in the firm in the accounting (Datastream code 242)
No of non-executives	Number of non- executive directors in the firms accounting year (Datastream code 243)
No of executives	No of directors - No non-executives
% of non-executives	Proportion of board who are non-executive directors,
Pre- tax profit	Firm's pre-tax profits -£'000 (Datastream code 154)
Net EPS	Firm's net earnings per share – pence (Datastream code 254)
Standard Deviation of Returns	Standard deviation of firm's daily return based on previous accounting year

All monetary variables adjusted to 2005/06 fiscal year prices using Retail Price Index excluding mortgage payment (source: www.stastistics.gov.uk)

<u>Appendix 2: Characteristics of Sample</u>

Panel A: Construction of Sample

Total Population of FTSE350 stocks during 1994-2006	776
Less unavailable data (& Inv. Trusts)	72
Less firms with less than 3 years data	289
Firms in sample	415

Panel B: Number of Firms per Year

Account Year	Number of Firms
1994/95	267
1995/96	343
1996/97	361
1997/98	377
1998/99	380
1999/00	371
2000/01	353
2001/02	347
2002/03	316
2003/04	314
2004/05	314
2005/06	300

Panel C: Distribution of the number of observations per firm

No of Account Years	Freq.	Percent
3	5	1.2
4	18	4.3
5	21	5.1
6	26	6.3
7	21	5.1
8	42	10.1
9	18	4.3
10	20	4.8
11	77	18.6
12	167	40.2
Total	415	100

Appendix 3: Industry/Sector Groups

Panel A:Industry Group Definitions

1	Resources (Including Mining, Oil & Gas)
2	Basic Industries (Chemicals, Construction, Forestry, Steel)
3	General Industrials (Aerospace, diversified industrials, Electronic & Electrical, Engineering)
4	Cyclical Consumer Goods (Automobiles, Household Goods & Textiles)
5	Non-cyclical Consumer Goods (Beverages, Food, Health, Personal Care, Pharmaceuticals, Tobacco)
6	Cyclical Services (General retailers, Leisure, Media, Support Services, Transport)
7	Non-cyclical Services (Food & drug Retailers, Telecommunications)
8	Utilities (Electricity, Gas, Water)
9	Financials (Banks, Insurance, Real Estate, speciality Finance)
10	Information Technology (IT Hardware, IT Software & Computer Services)

Panel B: Distribution of industry groups

indgroup	Freq.	Percent
1	14	3.37
2	52	12.53
3	49	11.81
4	6	1.45
5	45	10.84
6	132	31.81
7	16	3.86
8	20	4.82
9	59	14.22
10	22	5.3
Total	415	100

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