Executive Pay and Performance

in the UK 1994-2002

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Abstract

This paper examines the relationship between executive cash compensation and company performance for a sample of large UK companies over the period 1994-2002. This relationship is examined against a background of a series of reports into corporate governance mechanisms in UK companies. We show that base pay compensation of UK executives has increased substantially over this period, and we provide evidence on the movement in the pay-performance sensitivity over time. We identify an asymmetric relationship between pay and performance: in years and 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 in those cases when stock returns are low. This suggests that overall there is little relationship between pay and performance. We also explore the heterogeneity of the pay-performance relationship across firms, and find that board structure, firm size, industry and firm risk are all significant determinants of executive compensation.

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

I Introduction

In this paper we document the substantial increase in UK executive's base pay over the period 1994-2002, and examine the pay-performance relationship between executive compensation and corporate performance in the UK over this time. Executive compensation in the UK has received increasing attention, with the publication of a number of corporate governance reports, and our paper is a longitudinal study of UK executives' pay, providing an assessment of the effect of these reports on the pay-performance relationship over time. The sample period is an ideal testing ground, because of the dramatic increases in stock returns during the late 'nineties, and the subsequent fall in stock returns after the millennium.

A series of reports throughout the nineteen nineties recommended changes to the governance of UK companies. These recommendations have included: splitting the roles of chairman and chief executive (Cadbury (1992)), the disclosure of executive pay and the setting up of remuneration and audit committees (Greenbury (1995)), the numbers and responsibilities of non-executive directors on the board (Hampel (1998)), independence of non-executives (Higgs (2003)). Greenbury (1995) in particular suggested greater disclosure of executive pay and stronger scrutiny over the setting of executive compensation and emphasised that incentive compensation should have strict performance criteria. In our work we focus on the cash compensation part of an executive's total compensation package, since as we show below this has increased substantially over the period. Notwithstanding the role of incentive shares in aligning the interests of executives and shareholders, and ensuring that total compensation is more sensitive to firm performance, the growth in base compensation is dramatic, and understanding the relationship between base pay and performance is important and relevant.

Murphy (1999) provides a general overview of the literature, methodology and issues in executive compensation, starting from the influential study of Jensen and Murphy (1990), who first identified the pay-performance puzzle: that there is little relationship between executive pay and company performance. Conyon et al (1995), Main et al (1996) Conyon (1997) and Benito and Conyon (1999) have confirmed these low pay-

performance sensitivities (PPS) for UK firms, with typical elasticities of around 0.15.[1] Instead, past research has found that firm size seems to be dominant in determining the level of executive pay. 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, and total compensation, which adds in incentive components such as stock options and LTIPS. Most of the early UK literature relates to only cash compensation due to the difficulty of obtaining information on incentive based compensation. Main et al (1996) found that the inclusion of share option value increased the pay-performance elasticity from 0.15 to 0.71 for the total board remuneration and from 0.23 to 0.9 for the pay of the highest paid director. This translates into a cash compensation increase of £8,018 for the highest paid director compared with an increase of £50,600 in total compensation at the 1989 median level of pay, following a 10 per cent increase in shareholder return. This demonstrates that the inclusion of incentive components leads to a much greater increase in the directors' wealth. McKnight and Tomkins (1999) estimated higher estimates of PPS for total compensation, but this may attributed to the fact that they used a heuristic approach as opposed to Black-Scholes, to value share options. Conyon and Murphy (2000) document a shift from stock options to more performance based incentives such as LTIP's, which is consistent with Greenbury's recommendations. Bruce et al (2003) argue that it is essential that LTIPs 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".[2] In the current paper, we focus on the pay-performance sensitivity with respect to cash compensation, since aside from any incentive payments, we report below the growth in base pay of UK directors is well above the level of inflation and wage growth.

There is conflicting evidence as to whether the pay-performance relationship has weakened or strengthened over time. In the US Jensen and Murphy (1990) suggested

[1] Early UK studies such as Gregg et al (1993) found cash compensation elasticities of less then 0.05.
[2] Buck et al (203), page 1714. Renneboog and Trojanowski (2003) find that by including a variable for managerial turnover, the pay-performance relationship is strengthened.

that PPS had weakened since the 1930's. In contrast Hall and Liebman (1998) found that PPS had more than doubled since 1981. Gregg et al (1993) in the UK found the pay-performance relationship had weakened between 1983 and 1991, whereas Benito and Conyon (1999) suggested it had strengthened between 1985 and 1995. Conyon and Nicolisas (1998) looked at a sample of small to medium firms using cash compensation, and found that smaller firms had a weaker pay-performance sensitivity than found in studies featuring larger listed companies. Conyon and Sadler (2001) examined individual pay-performance sensitivities in and across firms as opposed to an average across all firms. They found that PPS varied across directors between and within firms. Also firms that have stronger corporate governance structures tend to have higher pay-performance sensitivities (see Bertrand and Mullainathan (2001)). 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) suggested that there is little evidence that relative performance to other firms in the industry is an important source of managerial incentives. In contrast in their comprehensive study of Relative Performance Evaluation (RPE), Gibbons and Murphy (1990) established that both industry and market relative performance played a role in shaping executive pay. They found that market performance had a stronger effect then relative industry performance using a large sample of 9,425 firm years over 1974 to 1984. Studies in the UK that have explored RPE have found insignificant results. Main et al (1996) found sector performance (rather then market performance) was insignificant but had a negative sign. Benito and Conyon (1999) also included relative performance, which was negative but insignificant.

Other factors considered in the literature include level of firm risk and corporate governance measures. Argarwal and Samwick (1999) reports that the level of firm risk (firm return variance) is an important determinant in the level of remuneration and this was robust across other measures of firm risk. By not allowing for the level of firm risk the pay-performance relationship will be underestimated. Firms are more likely to tie executive remuneration to that of the market when the firms return is less volatile in relation to the market. 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 fits with 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 the risk. Core et al (1999), Conyon and Murphy (2000), Conyon and Sadler (2001) and Garvey et al (2003) have tried to incorporate some form of risk element in their determination of executive pay.

Conyon (1997), Bentio and Conyon (1999), and Girma et al (2003) found very little evidence of corporate governance changes effecting the level and structure of CEO pay. These studies have shown the majority of firms have complied with the suggested recommendations such as splitting the role of the chairman and CEO, setting up a number of committees such as a remuneration, nomination committee but it appears it has done very little to change the level of pay or alter the pay-performance sensitivity. Girma et al (2003) found little change in the PPS after Cadbury except a slight increase for the largest firms and firms in the low pay quartiles.

II Methodology

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

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

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 that have been used previously include shareholders' wealth/return, earnings per share, and sales revenues. Control variables will include firm size, time dummies, number of directors and the number of non-executive directors. Pay may 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. Many past studies have used a first differenced approach to remove the fixed firm effects. The fixed effects approach removes the unobserved heterogeneity across firms, and so concentrates on those variables that change over time. With the fixed effects methodology, observations are transformed by subtracting the group mean and running OLS on these transformed variables. 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 September 2002. This list included all those companies that were constituents of the index at the end of the sample period on 23rd 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. In this way, the construction of the sample removes any concerns about survivorship bias.

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 a member of the LSE or firms may have unavailable

data. The first and last year will have relatively fewer firms since many firms may not have complete accounting year data if their relevant account year started/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 directors fees, emoluments for management services and pensions or pension fund 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 amount of remuneration paid to any director for the period. It may apply to a different director each year, and again the amounts include pension contributions and bonuses.

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 sales is used as a proxy for firm size in the regressions since the majority of prior studies have found this to be the most important determinant in the level of executive compensation. Although market capitalisation is a reasonable measure of firm size, it will be correlated with total shareholder return.[3] Past studies have shown that performance tends to be negatively related to firm size.

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 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) have calculated annual return 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 as opposed to the cumulative abnormal returns (CAR).

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

This paper uses the BHAR approach and cumulates daily returns on an annual basis to give total shareholder return for the particular account year. Market and industry

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

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

$$R_{it} = \alpha_i + \beta_i RFT_t + \varepsilon_{it}$$

The parameters from this regression can be used to calculate expected return i.e. $E(R_{it}) = \alpha_i + \beta_i RFT_t$ where RFT is the actual daily return on the 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 exactly 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 used are defined in panel A of appendix 3.

c) Board composition and Structure

Different firms will have different board sizes and composition, which may influence how much they pay their whole board. Main et al (1996) used total board remuneration to control for the number of directors and the composition of the board. Core (1999) and Cosh (1997) have explored the issue of executive compensation and the structure of the board though both in the context of an individual director's pay rather then the whole board. Core (1999) found that larger boards paid their CEO more in terms of both cash compensation and total compensation. They also found firms with a higher proportion of non-executives meant the CEO was paid more. Cosh (1997) using a set of UK firms also found that firms with a higher proportion of non-executives paid their CEO more. These findings contradict the predictions from agency theory. If the number of non-executive directors is used as a proxy for the level of monitoring then one would expect that the pay of the CEO/ highest paid director would be less. Other studies have found there appears to be very weak relationships between corporate governance structure and executive pay and the pay-performance relationship.

There are two measures of board structure that are included: the total number of directors, and the proportion of the non-executives on the board. 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 then 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. Various corporate governance reports such as Greenbury (1995) have recommended that the remuneration committee 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. The Cadbury report (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. Gibbons and Murphy (1992) include industries by SIC code, but this would result in too many industry groups, which would give little explanatory power since there would be few observations for each industry. In the Hemscott dataset the firms industry group is defined as the FTSE actuary industry group. These were grouped in the 10 industry groups, as detailed in 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 industry with only six firms is the cyclical consumer goods.

5. Inflation

Since the dataset is a panel over several years, the effects of inflation on the variables needs to be allowed for. All nominal variables were inflated to 2002 values by the monthly retail price index RPIX, excluding mortgage payments.

IV Overview of Directors Remuneration: Descriptive Statistics

The sample of 415 firms is an unbalanced panel in that some firms leave the sample before the end and others join the sample midway through. The total number of observations (firm years) is 2,859 but some observations may have missing values for some variables. Panel C in Appendix 2 shows the distribution of the number of observations per firm year, with the average number of firm years being 7. Over half of firms (239) have the maximum possible years of 8 with only about 21% of firms having less then 6 years. There were 14 firms that had a fiscal year missing due to changing of account year-ends. There were 18 firms that had an account year that was greater then 12 months that had annualised data from Datastream and their returns were subsequently 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 then the median, which suggests 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 show the changes in the average of the real value of total board pay and the pay of the highest paid director across the sample period.

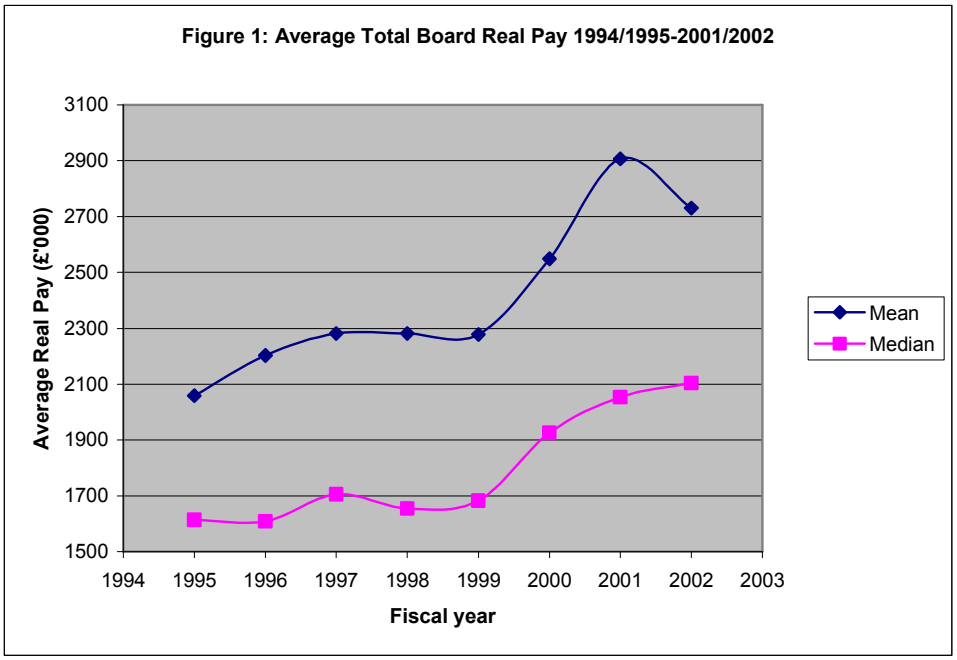

Fig. 1. Average real total board pay 1994/1995-2001/2002, pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices.

Over the whole period there has been a general rise in the average pay of the total board with a slight fall in the 2001/2002 accounting year.[2] The mean total board pay for the sample firms has risen by 33% and there has been a 30% rise in the median pay, all in real terms. This means in real terms on average the mean and median pay has risen by 4.7% and 4.3% respectively per annum. The gap between the median and the mean is quite wide and has widened over the sample period.

In figure 2, again there is an obvious difference in the mean and median of the highest paid director. Over the sample period there has been a big increase in the average pay of the highest paid director except in 2001/2002 where the mean pay fell slightly. It is evident that there has been a widening of the gap between the mean and the median since 2000. Over the entire period 1994/1995 – 2001/2002 mean pay of the highest paid director has risen by 60% and median pay by 45% in real terms. This is an average annual growth of 8.6% and 6.4% for mean and median pay respectively above inflation. These figures suggest that the average pay of the highest paid

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

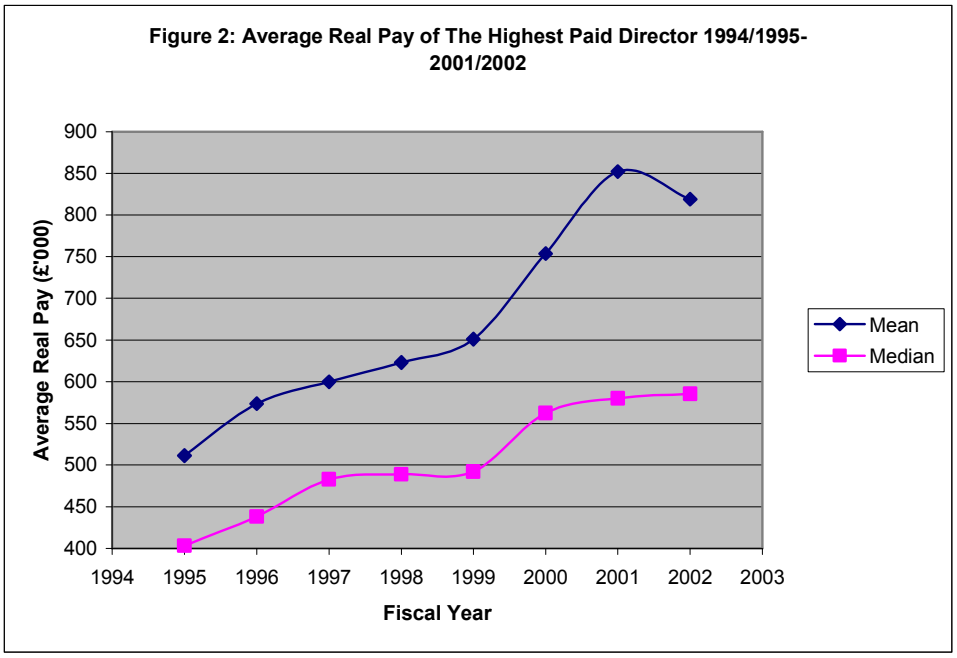

Fig. 2. Average real highest paid director pay 1994/1995-2001/2002, pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices.

director has been growing at a faster rate then that of the total board pay. This is also reflected in the slight growth in the ratio of the highest paid director pay to the pay of the total board. In the 1994/1995 fiscal year the average ratio was 0.274 but by 2001/2002 fiscal year it had risen to 0.318.

Not only are directors getting pay rises well above inflation levels but these are much greater then those of the average employee in their firm. In our sample on average the average director in a firm earns 11 times more then an average employee in that firm and this ratio has been rising over the sample period (in 1994/1995 it was around 9 times and by 2001/2002 it was 12 times). Whilst over the sample the average board pay has risen by 33% and the highest paid director by 60% the average employee costs has only risen by 11.72%. in real terms[4].

[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.

Exhibit 1 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).[4]

ASHE is a representative sample (about 1% of the working population) of employees in the UK, available from 1999 onwards. Exhibit 1 shows that over the period 1999-2002 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.

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 1994/1995 – 2001/2002. 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] **Exhibit 1**

Pay Group	Mean Real Pay Growth 1999-2002
Total Board Pay	19.90%
Highest Paid Director	25.75%
Managers and Senior Officials	15.30%
All Employees	9.50%

Exhibit 1: 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.

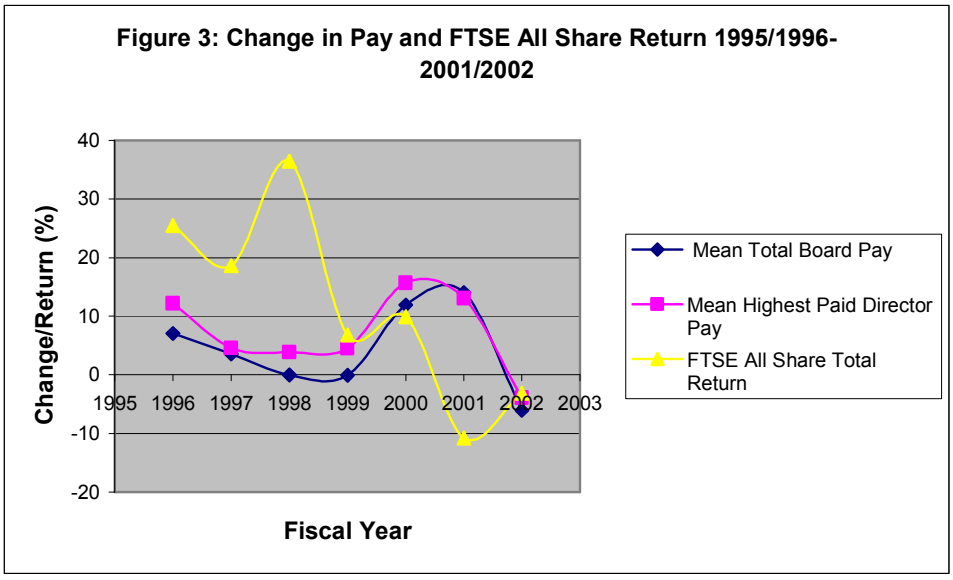

Fig. 3. A comparison of the percentage changes in both pay variables and the total return of the FTSE all share index 1995/1996-2001/2002, pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices.

The trend to having more non-executive directors on the board identified by Peasnell et al (1998) and Young (2000), is confirmed in figure 4 and Table 1 Panel D which shows the average composition of a company's' board.

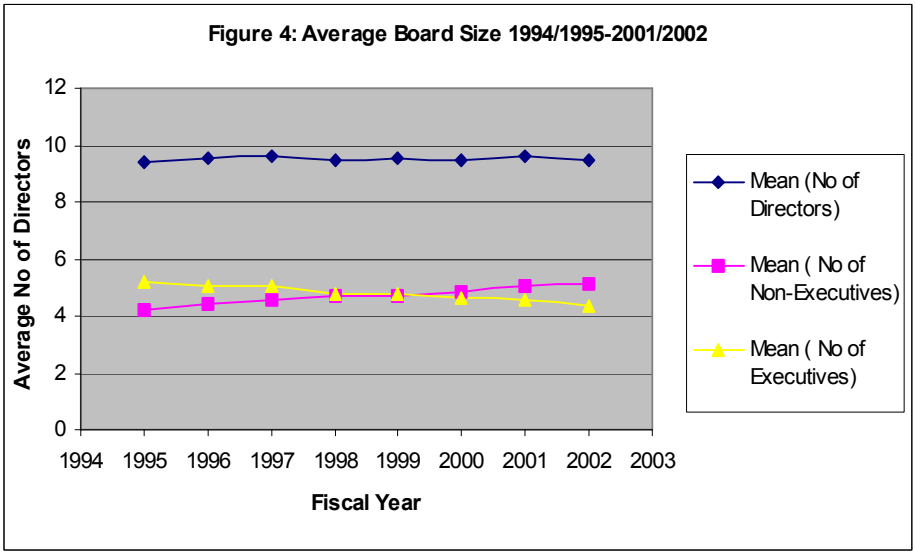

Fig. 4. Average board size, number of executives and number of non-executives 1994/1995-2001/2002.

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 slightly. In the 1994/1995 account year the majority of the board were executives, but by the 2001/2002 account year non-executive directors were n the majority, on average. In 1995 44.5% of a firms board comprised of non-executive directors but by 2002 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 2002 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 sales. The average market capitalisation adjusted for inflation is £3147.98m with only a median of £659.75m. The mean total sales are £2,318,285,000 with a median of £634,061,300. 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 since 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 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 sales was included in log form to reduce the effect of outliers in firm size. In all the regressions the control variables of total sales, number of directors and proportion of non-executives are used. Year dummies are included to allow for any aggregate effects that aren't constant over time such as macro economic shocks. Industry dummies allow for any possibility of differences across industries using the cyclical service industry as the reference industry, but can only be included in the random effects regressions

a) Fixed effects regressions

Estimates for the total board pay are shown in table 2 and those for the highest paid director in table 3. We first compare the fixed effects regression model with a random effects model. If the random effect model is consistent then this will give more efficient results then the fixed effects model, even though the fixed effects will still be consistent. For the total board pay regressions, a Hausman test of random effects consistency gives a test statistic of 33.89, which means the null of consistent random effects can be rejected. The Hausman test statistic for the highest paid director regressions is 107.36, so again the random effects model is rejected in favour of the fixed effects model. Therefore the main regression analysis for both dependent variables will come from fixed effects models.

Firm size has a much bigger effect on pay than firm return. In the fixed effects model the sales elasticity is around 0.2 for both pay variables which implies a 10% higher sales lead to roughly a 2% increase in pay so larger firms pay their boards/top director considerably more. In comparison, the total shareholder return has a much smaller effect on executive pay. This effect is slightly stronger for the pay of the highest paid director. The coefficients in column1 of tables 2 and 3, suggest that a 10% increase in total shareholder return will lead to a 0.4% increase in total board pay and a 0.6% increase in the pay of the highest paid director. A 10% increase in total sales and total shareholder return translates into a £35,752 and £7,150 increase in total board pay respectively at the median level of total board pay of £1,787,621. In the case of the pay of the highest paid director a 10% increase in sales and total shareholder return

translates into a £10,145 and a £3,043 increase in highest paid director pay at the median level of £507,243. Main et al (1996) also found a higher pay (cash compensation) performance elasticity for the highest paid director than for the total board pay.

The shareholder return estimates for the highest paid director are comparable to Conyon (1997) and Benito and Conyon (1999), but 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 2. [5] Most of the year dummy variables seem to be positively significant relative to the 1994/1995 fiscal year and the effect seems to get larger as you move through the years. This implies that pay has been continually rising over time above inflation as was highlighted by figures 1 and 2 in the descriptive statistics section.

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 32% and that of the highest paid

[5] **Exhibit 2: Time Dummy coefficients**

Fiscal Year	Total Board Pay	Highest Paid Director Pay
1995/1996	0.0225	0.0694
	[0.0234]	[0.0276]*
1996/1997	0.0764	0.1293
	[0.0232]**	[0.0274]**
1997/1998	0.1008	0.1906
	[0.0234]**	[0.0276]**
1998/1999	0.1172	0.208
	[0.0234]**	[0.0276]**
1999/2000	0.2112	0.323
	[0.0243]**	[0.0286]**
2000/2001	0.2813	0.3887
	[0.0252]**	[0.0297]**
2001/2002	0.3134	0.428
	[0.0257]**	[0.0303]**

Standard errors in brackets

director has grown by 43%. This highlights that much of the growth in directors' pay can not be attributed to the individual firms performance. This implies that corporate governance reports such as Greenbury (1995) that proposed that executive pay be more closely aligned with performance, have been ineffective.

The introduction of the industry dummies in the random effects model shows that there is some variation in pay levels among the industries though not all the industries are significantly different from the reference industry. The reference industry is the cyclical services industry, with the largest number of firms from our sample. Only the utilities and financials industries are significantly different from the reference industry and only financials receive more pay for both pay variables. Financials pay their board 21.77% and their highest paid director 19.5% more then the cyclical industries. Whilst the utilities pay their whole board 24.75% and their highest paid director 36.7% less.. These figures suggest there is strong variation in total pay across some industries although the random effects estimates may be inconsistent, but time invariant variables cannot be estimated under fixed effects regressions.

As would be expected the number of directors has a positive effect on the total board pay since there are more (possible higher quality) directors to pay. From the coefficients in column1, an increase in the board size by one director will increase total board pay by 6%. 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 pay of the board goes down. A 1% increase in the proportion of non-executives will reduce total board pay by 0.47%. 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 one would expect the proportion of the non-executives to have a negative effect on the pay of the highest paid director. Past studies such as Cosh

(1997) and Core (1999) have found that the proportion of non-executives has a positive effect on CEO pay. 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 column 3, of tables 2 and 3. The CDF of firm risk is positive 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. 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 0.1307 – a 10% increase in total shareholder return will lead to a 1.4% increase in cash compensation. The coefficient on the interactive variable is –0.1134, so for a firm with the highest level of risk (CDF=1) their pay performance estimate would be 0.1307-0.1134 = 0.0173. For a firm that had the median level of risk (CDF=0.5) their pay performance elasticity would be 0.1307-(0.5*0.1134) = 0.074. This demonstrates

that firms with a higher level of risk tend to have lower pay performance relationships, as has been found previously.

To allow for the potential endogeneity of the firm performance variable, we also estimated the regression using instrumental variable techniques. In the board pay regressions, when returns are instrumented by lagged returns reported in column 6 the return coefficient becomes larger than ordinary fixed effects but is insignificant. When the board pay regression is run using GMM the return coefficient increases to 0.069. In the GMM regression the effect of total sales is reduced from 0.2 to 0.0929, but this may reflect that lagged total board pay is included in the regression and total sales in the other regressions will be picking up the persistence of pay. Therefore the GMM regression shows as would be expected that there is some persistence in pay. The Hansen test shows that the null of invalid instruments can be rejected. In table 3 using lagged returns as an instrument for returns in the column 6 the coefficient on return becomes negative and significant, suggesting that lagged returns are poor instruments. The GMM regression coefficient in column 7 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

.

b) 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 columns 4 and 5 in tables 2 and 3 use market and industry adjusted returns. If the market/industry is doing well, 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. The 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 column 4 increases pay by £7,025; whilst a 10% return above the industry return from column 5 will lead to a £8,598.45 rise. Using similar information from Table 3, if return is greater then the market by 10%,

[6] We also tried different measures of performance, namely accounting based methods such a s change in real sales, return on assets, real net EPS, profits but all these variables were insignificant

the median highest paid director pay will increase by £3,033 and for a 10% increase above the industry return pay will rise by £3,566. It appears that firms do not use relative performance evaluation.

c) Interactive Dummy Variables

Our fixed effects estimates are an average across time, and companies that the coefficients relate to average estimates across time and companies. Any pay estimated pay-performance relationship will only be an average one, 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 dummies 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 performance elasticity has risen for both pay variables and by 2002 the elasticities were similar for both pay variables. For the total board it has risen from –0.02 in 1995 to 0.066 in 2002 and for the highest paid director it has risen from 0.024 to 0.066. But by 2002 these elasticities were not at a peak since there appears to be large fluctuations for both pay variables and the pay-performance relationship is not necessarily significant in each year. The largest elasticities were in 1997 and 1998 when the stock market was at its peak. This implies that there is a strong relationship between pay and performance when stock markets are rising, but a much weaker relationship when stock prices are falling. Since 2000 the performance elasticities have risen slightly despite the poor general performance of the stock market.

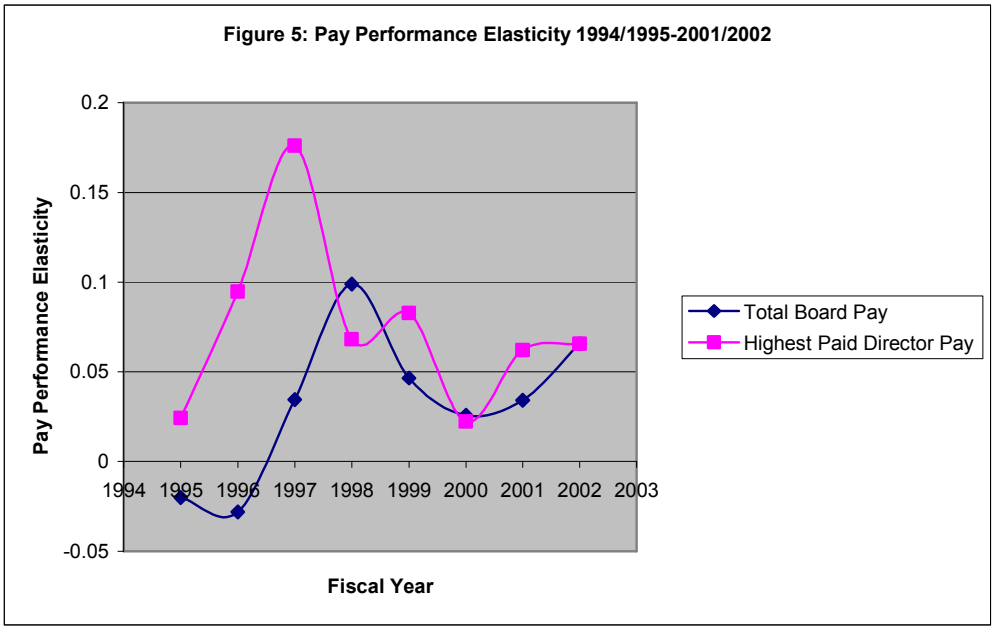

Fig. 5. Pay performance elasticities 1994/1995-2001/2002 obtained from fixed effects regressions.. Pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices. Performance is measured by total shareholder return.

F-tests on the differences in these pay-performance elasticities were $F(7, 2364) = 0.63$, $F(7, 2360) = 0.73$ for total pay and highest paid director respectively. The F-test shows that the coefficients are not significantly different from each other across time for both total board pay and highest paid director. This suggests that the interactive variables for both pay variables are not significantly different from each other so the pay-performance relationship has not appeared to have changed over time. This may reflect that there is very little pay-performance with cash compensation.

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.

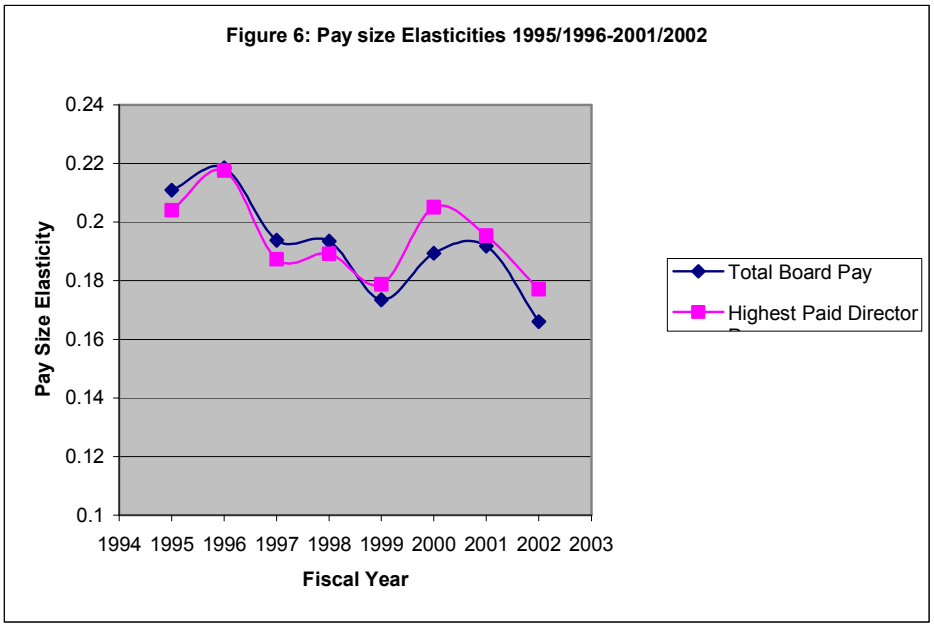

Fig 6. Pay size elasticities 1994/1995-2001/2002 obtained from fixed effects regressions. Pay is cash compensation (salary, bonus and pension contributions) and size is measured by total firm sales. Both pay and sales are inflated upwards to 2001/2002 fiscal year prices.

The pay size relationship has fallen slightly over the sample period for both pay variables. In the 1994/1995 fiscal year the pay size elasticity was 0.2109 and 0.2040 for total pay and that of the highest paid director respectively. By the 2001/2002 they had fallen to 0.1660 and 0.1771 respectively. This suggests there has been some change to the setting of executive compensation and the relationship between pay and size has fallen. Murphy (1999) reports that the pay size relationship had fallen for executive compensation in the US.

F-tests for the equality of the coefficients are F (7, 2364)=3.14 and F(7, 2360)=1.69 for the total board pay and the pay of the highest paid director. This suggests that there is no trend over time for the size sensitivity of the highest paid director but the pay-size sensitivity for total board pay has fallen. The pay-size relationship still seems more robust then the pay-performance relationship even if it has fallen slightly over time.

We also examined how the pay-performance relationship varied across different categories. This was done in two ways. Firstly for variables that varied across time interactive variables were included in the basic fixed effect regressions. For variables

that varied across firms but not across time pooled estimates of the pay-performance relationship were estimated using meta-analysis, a technique common in psychology and the medical sciences, and which is explained in Section d below.

Table 4 shows the effect of interactive dummy variables, that varied across time. If directors are rewarded for good performance but not punished for bad performance one would expect the pay and performance relationship to be significant when performance is good and non-existence when performance is bad. There was some suggestion of this in figure 5. This was tested by interacting the firm return variable with whether firms 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 median return the average pay-performance relationship is 0.0758 for the total board pay and 0.1217 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 identical 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.

Next, the firm return was interacted with whether the fiscal year was before or after the stock market down turn of March 2000. The relationship has become stronger for both pay variables after the stock 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. Alternatively this may reflect 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 by total sales, split by whether the firms were above or below median total sales in the particular fiscal year. There appears to be a stronger pay-performance relationship for larger firms. This contrasts with past research e.g. Jensen and Murphy (1990), Conyon and Sadler (2001).

d) Meta-analysis

Individual pay-performance estimates were calculated for each firm using interactive firm dummies, which gives an estimate of the average pay-performance relationship across time for each firm. Firms with less then five years worth of data were excluded from this type of analysis since it was deemed the time period was not sufficient to provide meaningful estimates.

Once we have estimates for each firm we can pool them in any way we wish. Since each firm has only a few observations standard errors are likely to be high so simply taking the arithmetic mean would lead to inefficient estimates. Meta-analysis will provide much better estimates since it weights each estimate according to their standard error so estimates with higher standard errors will have less weighting in the average estimate. For a description of meta-analysis and its application see Hedges and Vevea (1998) and Groot and Maassen van den Brink (2000).

Descriptive statistics for the individual firm pay-performance estimates for both pay variables can be found in table 5. From the standard deviations it is clear there is some degree of variation in individual estimates, particularly since the standard deviations are greater then the mean. This reflects the fact that many firms (around 40%) had negative performance estimates. Table 6 reports the pooled estimates using meta-analysis techniques. The pooling of all the individual estimates give different results then the mean pay-performance elasticities in table 5. This reflects the fact that meta-analysis weights each observation. These meta-analysis estimates are comparable to the average estimate across time and firms that would be obtained from a fixed effect regression.

The first variable used to group the individual estimates is industry group. Since the cyclical goods only had seven observations this was grouped with the cyclical consumer services. There seems to be a difference in the average pay-performance across industries but most of the estimates are insignificant. The utility industry has the biggest pay-performance relationship for both pay variables of 0.325 and 0.447 for the total board and highest paid director respectively. This is much larger then the average for all industries of 0.038 and 0.056. For the total board pay the utility, cyclical consumer goods and services and financial industries have significant

positive pay-performance elasticities. For the highest paid director the general, utility and cyclical consumer goods and services industries had positive significant pay-performance elasticities. For the majority of industries there does not appear to be any pay-performance relationship and some such as the non-cyclical consumer goods and services even have negative although insignificant relationships.

We then aggregated the individual estimates by various board structure variables. It should be noted that the number of directors (executives and non-executives) and the proportion of non executives present on the board were averages for each firm over the sample period since the pay-performance estimates were averages over this period.

The firms were pooled over whether on average over the sample period thay had more then or less than half their board composed of non-executive directors. Estimates were slightly higher for those with a proportion of non-executive directors of greater then 50% of 0.045, which was significant. Those with less then 50% had an insignificant estimate of 0.032 for total board pay. The estimates for the highest paid director were very similar regardless of the proportion of non-executive directors.

Estimates were pooled according to the size of the board split by whether the number of directors was above or below the sample average number of directors. Firms with larger boards tended to have higher pay-performance relationships for both total board pay and highest paid director pay. Estimates were also pooled according to whether the number of non-executive directors was greater or less then the sample average. Just because a firm has more non-executives than the average does not imply they have a higher proportion of non-executives to executives. This is a slightly different measure to the proportion of non-executive directors on the board. The results show that firms that had more non-executives than the average had a higher pay-performance relationship than those below the average for both total board pay and that of the highest paid director. This again emphasises that the structure and size of the board does have some influence on the relationship between pay and performance.

VI Conclusions

The objective of this paper has been to examine the determinants of both total board pay and the pay of the highest paid director, and to examine how this relationship has changed over time. In particular we were interested in the pay-performance relationship using total shareholder return as our main measure of performance. Our pay measure included salary, bonus and pension contributions. A caveat to our results is that pay variables did not include incentive payment, but given the increase in basic cash compensation over the period of study, it is relevant to examine whether there is any link between the basic 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 corporate governance reports.

The preferred estimation method was fixed effects regression to allow for the unobserved heterogeneity across firms. The main findings were that firm size has a dominant effect in determining the level of executive compensation, consistent with the results of previous studies. One explanation is that larger firms need higher quality directors and need higher pay levels to attract them. Pay levels in the US are much higher than in the UK, and therefore large UK firms need to pay more to attract mangers in an international managerial labour market.

The board structure variables had an effect on total board pay but not on the pay of the highest paid director. Firms with more directors have higher total board pay and pay will be less if there is a higher percent of non-executives.

The fixed effects regressions identified a slight relationship between the pay and performance of the company with estimates being slightly stronger for the highest paid director. There was no evidence of any relative performance evaluation as measured by the abnormal performance of the company, as distinct from the raw stock market returns, which includes general stock market movements. There was some evidence that industry adjusted returns may pay some role in setting executive pay.

We also explored the heterogeneity in the pay-performance relationship across firms. Following the publication of a series of corporate governance reports throughout the ‘nineties we expected to find an increase in these elasticities over time, since a

common theme of these reports is that executive pay should be related to company performance. However we identified an asymmetric relationship between pay and performance. We found that pay-performance elasticities were high when stock returns where relatively high, but that pay is less sensitive to performance when stock returns are low. This suggests that over time and across firms there is little relationship between pay and performance. There is some evidence that the relationship appeared to get stronger after the stock market crash of March 2000.

In conclusion, there is evidence that the pay-performance relationship for cash compensation does vary across firms, industries, firm size and board size and structure variables and the level of firm risk. The average estimates for all firms and across time highlight that even before the inclusion of incentive pay, executive pay has risen greatly over our sample period, but with little relationship between pay and performance. This is in direct contrast to the recommendations of various corporate governance reports, that have advocated a relationship between pay and performance.

Table 1: Descriptive statistics

Panel A: Pay Variables

Variable	No of Obs	Mean	Std.Dev	Median	Growth in Mean 1995-2002 (%)
Real Total Board Pay (£'000)	2857	2421.881	2167.771	1787.621	32.67
Real Highest Paid Director Pay (£'000)	2851	680.031	696.419	507.243	60.18

Panel B: Firm Size Variables

Variable	No of Obs	Mean	Std.Dev	Median	Growth in Mean 1995-2002 (%)
Real Market Capitalisation (£m)	2859	3147.979	9892.754	659.745	87.70
Real Total Sales (£'000)	2826	2318285	5638000	634061.3	25.47

Panel C: Return Variables

Variable	No of Obs	Mean	Std.Dev	Median
Firm Total Shareholder Return	2859	0.1824	0.7545	0.0902
CAPM Market adjusted Firm Return	2859	0.12065	0.7469	0.0230
CAPM Industry adjusted Firm Return	2859	0.11997	0.7164	0.0290
Real Net EPS (pence)	2824	18.94	65.04	17.72
Real Return on Assets	2826	0.0678	0.1944	0.0768

Panel D: Board Structure

Variable	No of Obs	Mean	Std.Dev	Median	Mean 1995
No of Directors	2852	9.5	2.9	9	9.43
No of Executive Directors	2836	4.78	1.92	5	5.2
No of Non-Executive Directors	2836	4.71	2.1	4	4.21
Proportion of Non-Executives (%)	2836	0.494	0.138	0.5	0.44

For definitions of all variables see appendix 1. All real variables are inflated upwards to 2001/2002 fiscal year prices

Table 2: Total Board Cash Compensations Regressions

Dependent variable is ln(Total Board Pay)

	Fixed Effects	Random Effects	Fixed Effects with Firm Risk	CAPM	Industry CAPM	Fixed Effects IV	GMM
	1	2	3	4	5	6	7
ln(Total sales)	0.2016	0.2149	0.2024	0.2019	0.2027	0.216	0.0929
	[0.0137]**	[0.0091]**	[0.0137]**	[0.0137]**	[0.0136]**	[0.0219]**	[0.0163]**
ln(1 + firm return)	0.0417	0.0429	0.1307			0.0744	0.0686
	[0.0129]**	[0.0129]**	[0.03097]**			[0.1899]	[0.0167]**
ln(1+ market adjusted return)				0.0393			
				[0.0125]**			
ln(1+ industry adjusted return)					0.0481		
					[0.0134]**		
% of non-executives	-0.4678	-0.5217	-0.4694	-0.4715	-0.4763	-0.4268	-0.4541
	[0.0716]**	[0.0651]**	[0.0716]*	[0.0716]**	[0.0718]**	[0.0800]**	[0.0777]**
No of Directors	0.0622	0.0687	0.0623	0.0622	0.0628	0.0556	0.0557
	[0.0043]**	[0.0039]**	[0.0043]**	[0.0044]**	[0.0043]**	[0.0062]**	[0.0068]**
lag total board pay							0.4901
							[0.0601]**
CDF Firm Risk			0.0213				
			[0.0290]				
CDF Firm Risk* ln (1 + firm return)			-0.1134				
			[0.0481]**				
Resources		0.0374					
		[0.0973]					
Basic Industries		-0.0305					
		[0.0557]					
General Industries		0.0062					
		[0.0598]					
Cyclical Consumer Goods		0.1659					
		[0.1341]					
Non-Cyclical Consumer Goods		0.0763					
		[0.0611]					
Non-Cyclical Services		-0.0172					
		[0.0950]					
Utilities		-0.2475					
		[0.0922]**					
Financials		0.2177					
		[0.0539]**					
Information Technology		-0.1318					
		[0.0822]					
Constant	4.30	4.07	4.2811	4.30	4.29	4.4358	2.2447
	[0.1740]**	[0.1157]**	[0.1754]**	[0.1739]**	[0.1736]**	[0.2774]**	[0.2399]**
Observations	2794	2794	2794	2793	2786	2378	2378
Hansen Test							36.91
Number of firms	410	410	410	410	410	410	410
R-squared	0.35		0.35	0.35	0.35		

Standard errors in brackets; * significant at 5%; ** significant at 1%; Time dummies are included but not reported

Table 3: Highest Paid Director Cash Compensation Regressions

Dependent variable is ln (Highest paid director's pay)

	Fixed Effects	Random Effects	Fixed Effects with Firm Risk	CAPM	Industry CAPM	Fixed Effects IV	GMM
	1	2	3	4	5	6	7
ln(Total sales)	0.1979	0.2065	0.1987	0.1981	0.1979	0.1425	0.1112
	[0.0161]**	[0.0107]**	[0.0161]**	[0.0161]**	[0.0160]**	[0.0409]**	[0.0174]**
ln(1 + firm return)	0.0628	0.0638	0.1412			-0.808	0.0681
	[0.0152]**	[0.0152]**	[0.0468]**			[0.3546]*	[0.0180]**
ln(1+ market adjusted return)				0.0598			
				[0.0147]**			
ln(1+ industry adjusted return)					0.0703		
					[0.0159]**		
Proportion of non-executives	0.1631	0.207	0.1615	0.1583	0.1522	0.1792	0.189
	[0.0847]	[0.0767]**	[0.0847]	[0.0847]	[0.0849]	[0.1516]	[0.1013]
No of Directors	0.0018	0.0076	0.0019	0.002	0.002	-0.0193	0.0167
	[0.0051]	[0.0046]	[0.0051]	[0.0051]	[0.0051]	[0.0115]	[0.0064]**
lag highest paid pay							0.4253
							[0.0548]**
CDF Firm Risk			0.0217				
			[0.0342]				
CDF Firm Risk* ln (1 + firm return)			-0.0995				
			[0.0567]				
Resources		-0.0166					
		[0.1149]					
Basic Industries		-0.0852					
		[0.0657]					
General Industries		0.0008					
		[0.0706]					
Cyclical Consumer Goods		0.2075					
		[0.1583]					
Non-cyclical Consumer Goods		0.0438					
		[0.0721]					
Non-cyclical Services		-0.0964					
		[0.1121]					
Utilities		-0.3673					
		[0.1088]**					
Financials		0.1945					
		[0.0637]**					
Information Technology		-0.1884					
		[0.0971]					
Constant	3.28	3.09	3.2566	3.27	3.28	4.3471	2.0406
	[0.2052]**	[0.1363]**	[0.2069]**	[0.2051]**	[0.2049]**	[0.5173]**	[0.1911]**
Observations	2790	2790	2790	2789	2782	2376	2373
Hansen Test							38.5
Number of firms	410	410	410	410	410	410	410
R-squared	0.28		0.28	0.28	0.28		

Standard errors in brackets; * significant at 5%; ** significant at 1%; Time dummies are included but not reported

Table 4: Coefficients on interactive return variables, by median

Interactive Regression	Variable interacted with firm return	Total Board Pay	Highest paid Director
Firm Return	Firms with return above median return in fiscal year	0.0758	0.1217
		[0.0229]**	[0.0269]**
	Firms with return below median return in fiscal year	0.0074	0.0038
		[0.0229]	[0.0270]
Stock Market Performance	Good stock market performance fiscal year<2001	0.0351	0.0639
		[0.0180]	[0.0211]**
	Poor stock market performance fiscal year>2000	0.0499	0.0614
		[0.0204]*	[0.0240]*
Firm Size	Firms above median sales	0.0931	0.123
		[0.0228]**	[0.0269]**
	Firms below median sales	0.019	0.0364
		[0.0153]	[0.0180]*

Table 5: Descriptive statistics of the individual firm pay-performance elasticities

Variable	N	Mean	Median	St.Dev	25%	75%
Total Board Pay	368	0.052777	0.057118	0.4913639	-0.10781	0.217937
Highest Paid Director	368	0.0918	0.061814	0.5282505	-0.12276	0.289354

Table 6: Pooled pay-performance coefficients using meta-analysis

Variable estimates are pooled across	No of obs	Total Board Pay	Highest paid Director
All	363	0.038	0.056
		(3.055)**	(3.734)**
Resources	13	0.049	0.113
		-0.713	-1.351
Basic Industries	51	0.065	0.089
		-1.229	-1.372
General Industries	42	0.078	0.118
		-1.847	(2.292)*
Cyclical Consumer Goods and services	124	0.045	0.082
		(2.136)*	(3.199)**
Non-cyclical Consumer Goods	37	-0.005	-0.008
		(-0.150)	(-0.178)
Non-cyclical services	15	-0.039	-0.025
		(-0.894)	(-0.483)
Utilities	13	0.325	0.447
		(3.053)**	(3.446)**
Financials	51	0.099	0.092
		(2.486)*	-1.881
Information Technology	17	0.003	-0.013
		-0.103	(-0.351)
Proportion of non-exs>0.5	184	0.045	0.055
		(2.497)*	(2.884)*
Proportion of non-exs<0.5	184	0.032	0.052
		-1.804	(2.383)*
Larger Boards	161	0.066	0.083
		(2.909)*	(3.009)**
Smaller Boards	202	0.026	0.045
		-1.757	(2.502)*
Above average number of non-exs	151	0.051	0.084
		(2.332)*	(3.153)**
Below average number of non-exs	212	0.031	0.043
		(2.105)*	(2.366)*

Z scores in brackets

* significant at 5%, **significant at 1%

APPENDICES

Appendix 1: List of Variables

Accounting Year	This is the individual firms accounting year as given by the year ends from Datastream
Fiscal Year 1995-2002	Set of fiscal years which firms account year is matched up with - used as year dummy variables in regression
FTSE Index	Index the company was in at the end of the firms accounting year - FTSE 100, FTSE 250, FTSE small cap, FTSE fledgling or FTSE aim
Indgroup1-10	A set of 10 sector groups as detailed in Appendix 3
Market Capitalisation	Market capitalisation of the firm at the end of the accounting year – £m (source: Hemscott trading dataset)
Total Sales	Total sales - £'000 (Datastream code 104)
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	This is the individual firms total shareholder return by accounting year (source: Hemscott trading dataset)
FTSE All Share	Value of the FTSE all share -£ (Datastream)
FTSE All Share Return	Total annual return of FTSE all share index by firms accounting year (Datastream)
Firm market adjusted return	The firms abnormal return for the firms accounting year using expected returns from our CAPM model - explained in section 3b
Firm industry adjusted return	The firms abnormal return for the firms accounting year using expected returns from our Industry CAPM model - explained in section 3b
No of Directors	The total number of directors in the firm in the accounting (Datastream code 242)
No of non-executives	The 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	This is the proportion of the whole board which comprises of non-executive directors, no of non-executives/no of directors
Pre- tax profit	Pre tax profits -£'000 (Datastream code 154)
Net EPS	Net earnings per share – p (Datastream code 254)
Standard Deviation of Returns	Standard deviation of firms daily return based on previous accounting year

All monetary variables inflated upwards to 2001/12002 fiscal year prices using Retail price index (source: www.stastistics.gov.uk)

Appendix 2: Characteristics of Sample

Panel A: Construction of Sample

Total Population of FTSE350 stocks during 1994-2002	571
Unavailable Data	72
Less then 3 years	84
Firms in sample	415

Panel B: Number of Firms per Year

Account Year	Number of Firms
1994/1995	267
1995/1996	343
1996/1997	361
1997/1998	377
1998/1999	380
1999/2000	371
2000/2001	353
2001/2002	347
2002/2003	60

Panel C: Distribution of the number of observations per firm

No of Account Years	Freq.	Percent
3	17	4.1
4	30	7.23
5	41	9.88
6	45	10.84
7	43	10.36
8	239	57.59
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 indusrials, Electronic & Electrical, Engineering)
4	Cyclical Consumer Goods (Automobiles, Household Goods & Textiles)
5	Non-cyclical Con. Goods (Beverages, Food, Health, Personal Care, Pharmaceuticals, Tobacco)
6	Cyclical Service (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 group

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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