Executive Pay and Performance

in the UK 1994-2002

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Abstract

This paper examines the relationship between executive compensation and company performance for a sample of large UK companies over the period 1994-2002. The relationship is examined against a background of a series of reports into corporate governance mechanisms in UK companies. We provide evidence on the movement in the pay-performance sensitivity over time, and we identify an asymmetric relationship between pay and performance up to 2000. In years in which stock returns are high, pay-performance elasticities are high, but we find that executive pay is insensitive to performance in those periods when stock returns are low. This suggests that over time 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 all have an effect on executive compensation.

Keywords: Executive compensation, pay and performance
JEL Classification:

I Introduction

In this paper we document the pay-performance relationship between executive compensation and corporate performance in the UK over the period 1994-2002. Executive compensation in the UK has received increasing attention over this period with the publication of a number of corporate governance reports. This paper is a longitudinal study of UK executives' pay, so that we can assess the effect of these reports on the pay-performance relationship over time. This 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 have 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.

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 identified the pay-performance puzzle that there is little relationship between executive pay and company performance. Instead, past research has found that firm size seems to be dominant in determining the level of executive pay. Conyon et al (1995) reviewed the situation in the UK up to 1995. Main et al (1996) looked at both the pay of the total board and the highest paid director found a pay size elasticity of 0.14 for the board and 0.21 for the highest paid director. Studies by Conyon (1997) and Benito and Conyon (1999) found elasticities of around 0.06 for the cash compensation of the highest paid director. In the US the pay size relationship is slightly higher with estimates of around 0.25-0.35 found in most studies (see Rosen (1990)). It appears that the pay size relationship has remained robust across studies and therefore across time. Conyon and Murphy (2000) found a pay size relationship of 0.32 for US firms and 0.2 for UK firms. Although Girma et al (2003) found some

evidence that the pay size relationship had strengthened slightly after the introduction of the Cadbury report (1992) reforms.

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. They compare executive pay in the UK and US and report that in 1997 the chief executives in the top 500 UK firms earned on average £660,000 each (including gains from stock options) compared with £6.3 million for the top 500 US firms. Though they found that UK cash compensation has been rising by an average of 10% per annum compared with only 6.4% for US firms between 1989 and 1997. So although executives in UK firms receive large levels of compensation, their compensation is small in comparison with executives in US firms. Nonetheless as we report below the growth in pay of UK directors is well above the level of inflation and wage growth.

Murphy (1999) draws a distinction between cash compensation, which includes base salary and annual bonuses, and total compensation, which includes 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. This demonstrates that the inclusion of incentive components leads to a much greater increase in the directors' wealth. These are much higher then previous UK estimates (prior to 1996)[1] using cash compensation and for those using total compensation. McKnight and Tomkins (1999) found even higher estimates for total compensation but this may attributed to the fact they used a later sample and they used a heuristic approach as opposed to a Black and Scholes approach to value share options. .

[1] Early UK studies such as Gregg et al (1993) found cash compensation elasticities of less then 0.05.

There are contradicting results in both the US and the UK as to whether the pay-performance relationship has weakened/strengthened over time. In the US Hall and Liebman (1998) found that it had more than doubled since 1981. In contrast Jensen (1990) and Murphy had found it had weakened since the 1930's. Gregg et al (1993) in the UK found it had weakend between 1983 and 1991 whereas Benito and Conyon (1999) found it had strengthened between 1985 and 1995. Most past research only estimate an average pay-performance relationship for all firms but some studies have allowed for heterogeneity of firms. There is some suggestion that the pay-performance relationship may vary across firms and even within firms. A study by Conyon and Nicolisas (1998) who looked at a sample of small to medium firms using cash compensation found that smaller firms had a weaker pay-performance sensitivity then found in studies featuring larger listed companies. Conyon and Sadler (2001) looked at individual pay-performance sensitivities in and across firms as opposed to an average across all firms. They found that it varied across directors between and within firms. Also firms who 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) found little evidence that relative performance to other firms in the industry is an "Important source" of managerial incentives. In their comprehensive study of relative performance evaluation (RPE) Gibbons and Murphy (1990) found evidence of both industry and market relative performance playing a role in shaping executive pay. They found that market performance had a stronger effect then relative industry performance using a big sample of 9,425 firm years over 1974 to 1984. The majority of later studies particularly in the UK who 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 issues considered in the literature include level of firm risk, CEO age, effect of mergers and corporate governance issues. 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 will demand higher salaries and less comprised as performance based when risk is high in order to bare less of the risk. Core et al (1999), Conyon and Murphy (2000), Conyon and Sadler (2001) and Garvey et al (2003) are examples of other studies that have tried to incorporate some form of risk element in their determination of executive pay.

Past studies have shown that CEO pay increases with age but age has less of an effect on the level of bonuses and performance related forms of remuneration. See Mcknight et al (2000) who look at the effect of CEO age for a UK sample of firms. Some past studies have also found that executive compensation increases after a merger even though stock price performance tends to decrease. This can be attributed to the fact that mergers increase the size of the firm. Bliss and Rosen (2001) found that compensation grew faster with growth from mergers then internal growth in their study of US bank mergers. Girma et al (2002) look at the effect of mergers in the UK and found that mergers did increase executive remuneration but pay is nine times more sensitive to internal growth.

In past work Conyon (1997), Bentio and Conyon (1999), and Girma et al (2003) have 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, fixed effect regressions will be used. 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. One shortcoming of this approach is the loss of the first year's observations from first differencing whereas in fixed effects regressions all observations are used.

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 who had less then three years worth of return/account data and other firms who 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. The definitions given by Datastream for the two measures of directors' compensation used in the current study are as follows: a) 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. b) Pay of the highest paid director (Datastream code 244 (£'000s)), which represents the

highest amount of remuneration paid to **any** director for the period. It may be to a different director each year. 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. This raised a problem of how to relate accounting years to fiscal years, as distinct from US firms, that always have an account year-end, which matches the calendar year i.e. account year finishes on December 31st.

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. Whereas, a company with a year-end in May 1995 would be allocated to the 1995/96 fiscal year. This classification made sense since the economic conditions such as tax levels are likely to be the same in a fiscal year as opposed to a calendar year. For programming reasons, the classification to fiscal years was made on the basis of the month in which the year-end occurred rather than the actual date. Since some firms used the same day of the month e.g. the same Friday every year this may cause some accounting years to start in a different month. This would create some accounting years with less/greater number of months then twelve. In these cases the nearest month end was used so each accounting year would run from the same month. This is the same method that the PWC corporate register used to deal with inconsistent account years.

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 who changed their accounting years:

1) Those who changed their accounting year to a later date in the accounting year e.g. September 1999 to December 1999
2) Those who changed their accounting year to an earlier date in the accounting year e.g. September 1995 to June 1995

In order to reduce the amount of data that we discard it was decided to annualise years where data was for an accounting period different to 12 months.

4. Explanatory variables

a) Firm Size

Total firm sales will be 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 may be correlated with total shareholder return.[2] Past studies have shown that performance tends to be negatively related to firm size.

b) Firm Performance

The main measure of company performance is total shareholder return, since the purpose of performance related pay is to align the interests of the directors with those of the shareholders. It makes sense to use total shareholder return rather than corporate profits, although we 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. Past studies such as Main et al (1996), 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).

[2] 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.

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

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 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. One problem that occurred was for those firms who changed their accounting years. In which case we estimated the parameters over the full year prior to the new accounting year. For the first accounting year, we used in-sample estimates of the coefficients. 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 the firm is in. 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 what you'd expect

from agency theory. If the number of non-executive directors is used as a proxy for the level of monitoring then you'd 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.

It might be expected that board structure will play more of a role in shaping total pay then the pay of the highest paid director. There are two measures of board structure that are included. These are the total number of directors on the board and the proportion of the non-executives on the board. Firms who 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 their total boards pay in one year because there are additions to the board rather then any pay increases to the existing members so 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 The effect of a change in the number of directors may be reflected within firms as well as between firms.

The proportion of non-executives should be allowed for since non-executives receive less compensation since they only receive fees and may monitor the board so this may also have an effect on the pay of the highest paid director. Non-executive directors only receive fees for their services 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 expected the board structure variables may play some role in shaping the pay of the highest paid director but have less of an effect then it does on total board pay. 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. A variable for the industry group was created. Conyon and Murphy (2000) used only four categories of industry group: mining and manufacturers, utilities, financial services and other. Other studies have tried to include industries by SIC code for example Gibbons and Murphy (1992) but this would result in too many precise industries, which would give very 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. Therefore all nominal variables were inflated to 2002 values by the monthly retail price index RPIX, excluding mortgage payments. Nominal variables were inflated in terms of their account years rather then calendar years but this shouldn't effect across firms comparisons since the annual inflation rate by month is pretty similar.

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. Firms won't necessarily have the same 8 years due to the way the data is divided into fiscal years. Firms will either have account data for the 8 fiscal years 1995-2002 or 1996-2003 fiscal 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 who 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 shows 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. Each graph reports the mean and median and use the 1994/1995 to 2001/2002 fiscal years but not the 2002/2003 one since it only had 60 observations and was not a complete fiscal year so may give misleading results.

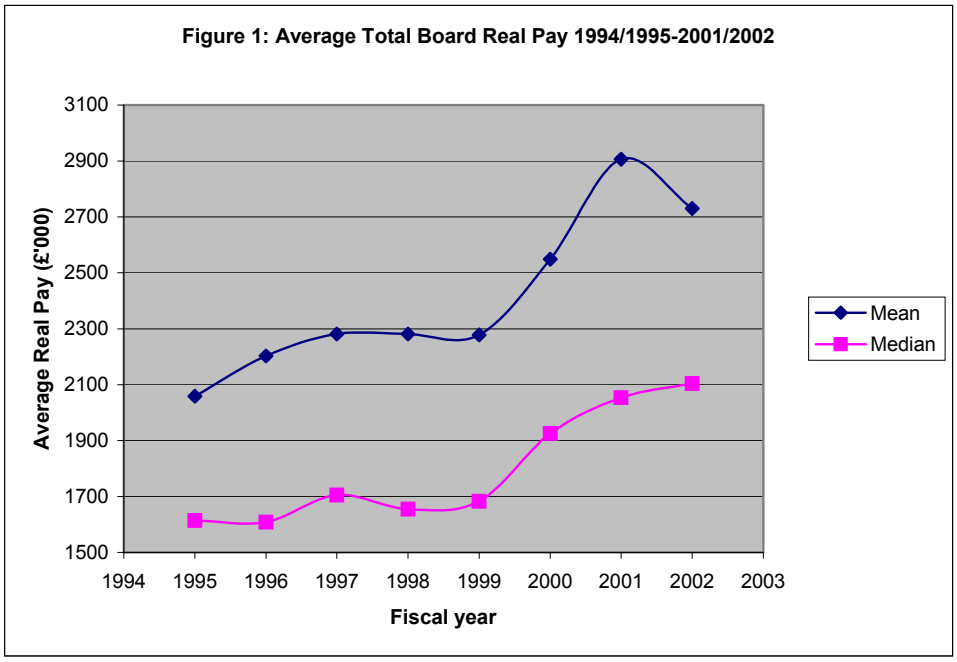

Fig. 1. Average real total board pay 1994/1995-2001/2002, pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices.

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.[3] 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.
[3] Again similar results were found when pay was adjusted for wage growth rather then inflation.

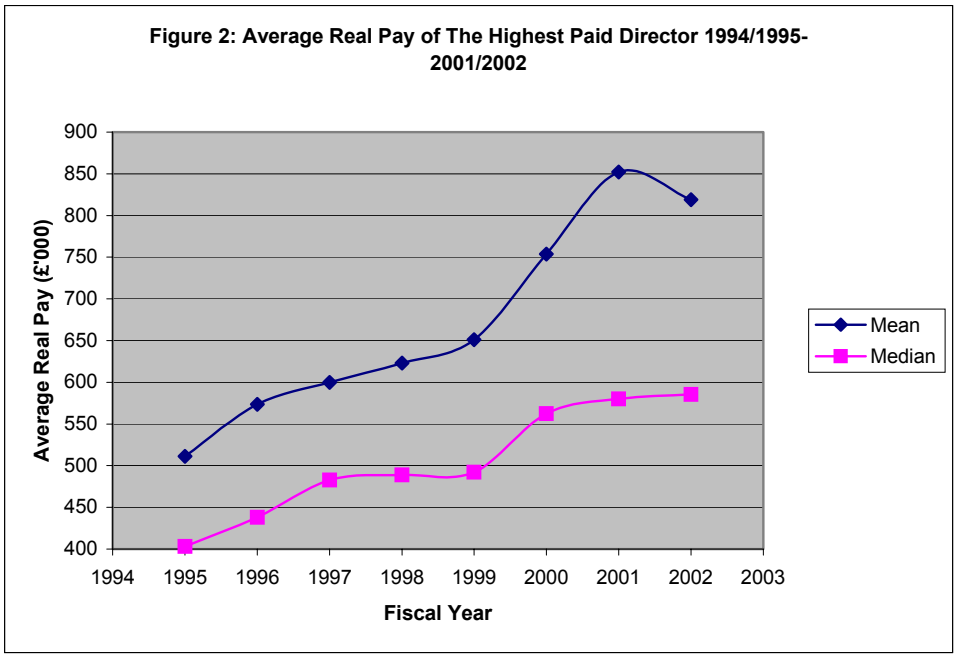

Fig. 2. Average real highest paid director pay 1994/1995-2001/2002, pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices.

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). These ratios are underestimated since the comparison doesn't include share options and other incentive components, which would further increase directors income. 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).[3]

ASHE is a representative sample (about 1% of the working population) of employees in the UK, although as to date data from ASHE is only available from 1999 onwards. Exhibit 1 shows that over the period 1999-2002 executive pay has risen much faster then that of managers and senior officials and more then double that of all employees in the UK. What we are documenting is that executive pay 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 does seem to follow that of the market index but the change is less pronounced and there appears to be 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 been documenting may be attributed to the fact that between the 1996 and 1999 fiscal years the stock market grew by 58%.

[3] **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.

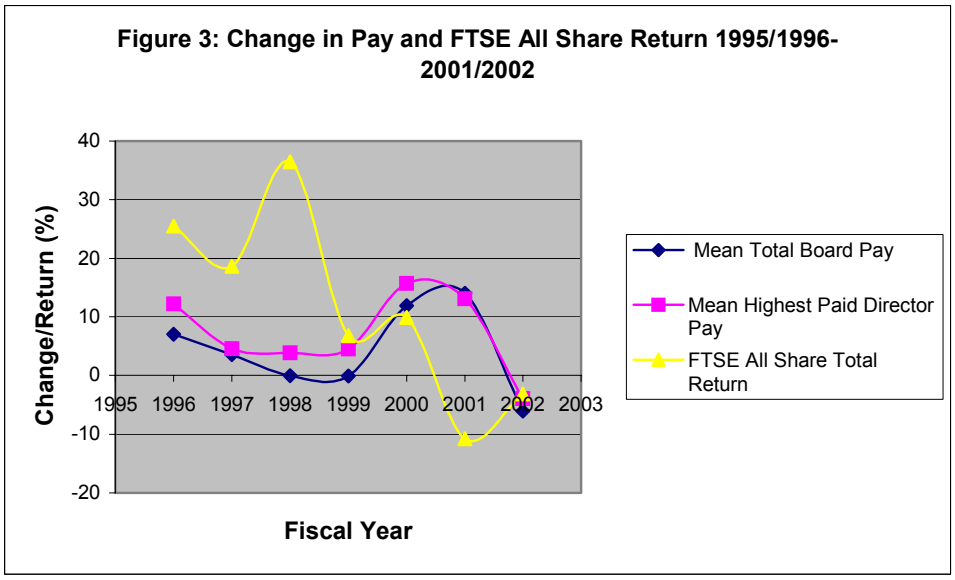

Fig. 3. A comparison of the percentage changes in both pay variables and the total return of the FTSE all share index 1995/1996-2001/2002, pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices.

Pay may be affected by the structure of the board since firms with more directors may pay their directors more and executives will be paid more then non-executives. The trend to having more non-executive directors on the board identified by Peasnell et al (2003), is confirmed in figure 4 and Table 1 Panel D which shows the average composition of a company's' board.

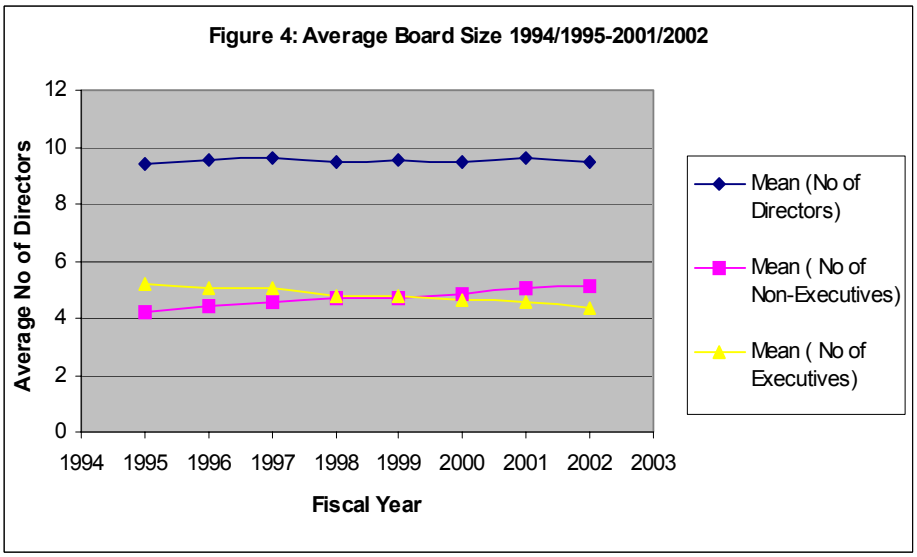

Fig. 4. Average board size, number of executives and number of non-executives 1994/1995-2001/2002.

On average there are approximately 9 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 there were slightly more executives but by the 2001/2002 account year there were more non-executive directors on average. In 1995 on average 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 may reflect the various corporate governance reports such as the Cadbury (1992) and Greenbury (1995), which have highlighted the importance of and recommended an increase in the number of non- executive directors. The Hampel (1998) recommended that the board should comprise at least a third of non-executives and in 2003 the Higgs report went as far to recommend 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. Therefore since the overall composition of the board hasn't changed much then the number of directors may not affect pay across time but it may affect directors across companies. Since the average board size has not changed the evidence in figure 4 implies 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 a lot 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.

Board pay is quite highly correlated with the number of directors with a correlation coefficient of 0.556 so this should be controlled for in any regressions. It is also highly correlated with the number of executives and number of non-executives with correlation coefficients of around 0.4 for both variables, which themselves are both highly correlated with the number of directors. The number of non-executives and executives themselves are not correlated so having many non-executives doesn't mean a firm has lots of executives and vice versa.

Having a large board doesn't necessarily mean the firm itself is a large one. Theory would suggest larger firms would need a bigger board to manage it but being a large firm doesn't necessarily mean the firm is more complex. Although the board size is related to firm size (total sales) the correlation is less then 0.5 so large firms won't necessarily have larger boards. There is a much stronger correlation with firm size and the number of non-executive directors then with the number of executive directors. Larger firms in particular the FTSE 100 firms may have more non-executives due to more pressure to comply with the various corporate governance reports or they need more outside expertise/monitoring.

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 the various 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),* which reduces the effect of large outliers. In all the regressions the control variables of total sales, number of directors and proportion of non-executives are used. Total sales was included in log form since this gave a better fit and reduced the effect of possible outliers, since in the descriptive statistics it was obvious there was big differences in the size of some firms. The number of directors was included rather then the log of the number of directors since it makes more sense to interpret the effect in the increase in the number of directors rather then the percentage change in the number of directors.

Year dummies are included to allow for any aggregate effects that aren't constant over time such as macro economic shocks. The reference year will be the first fiscal year, 1994/1995. The 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. It is instructive to 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 effect model will still be consistent. For the total board pay 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. This means the fixed effects model is favoured over the random effects model. The Hausman test statistic for the highest paid director pay is 107.36 so again the random effects model is rejected in favour of the fixed effects model. The main regression analysis will come from fixed effects models.

Firm size has a much bigger effect on pay than firm return does as past studies have also found e.g. Conyon and Murphy (2000). In the fixed effects model a 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. A sales elasticity of 0.2 is consistent with other past studies using UK firms though these studies have generally only used the pay of the CEO. In terms of the total board pay our estimates are slightly higher then in the literature, though only Main et al (1996) has used this measure and their sample does refer to an earlier period of 1983-1989.

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. 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) who used cash compensation but lower for later more recent studies such as Conyon and Murphy (2000). Since this later study was undertaking a cross-sectional study, this would imply that in our panel study the pay-performance relationship has declined over time. Our estimates for total board pay are lower then Main (1996) who found estimates of around of 0.15 but this may reflect that Main only used a cross section of 60 FTSE 100 firms.

Although not reported in table 2 and table 3 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 coefficients for the time dummies in the basic fixed effects regression are shown in Exhibit 2. The time variables will be picking up any factors that change over time but are the same across all firms.[4]

[4] **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

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 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) which 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 since this is the industry with the largest number of firms in it from our sample. Only the utilities and financials industries are significantly different from the cyclical services 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. An increase in the board size by 1 director will increase pay by 6%. Although the number of directors has a positive but insignificant effect on the pay of the highest paid director.

Although not reported, without the inclusion of the board structure variable, the coefficient on firm sales increases to 0.27 and the coefficient on for the pay of the total board since larger firms tend to have larger boards and therefore greater pay. The coefficient on the total shareholder variable for total board pay is reduced to 0.031 without the inclusion of the board size and structure variables. This provides further motivation for using the board structure variables, since the pay-performance relationship for the total board pay may be reduced if we are not allowing for the fact that some firms may pay more simply because they have more executives and less

non-executive directors. Whereas the removal of these board variables has very little 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. 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). It maybe the case they have the same number of executive directors as other firms just more non-executives. Therefore the proportion of non-executives may be a proxy for the level of monitoring so more monitoring (more non-executives) may 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 fact the effect in the regression 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 effect the pay of the whole board.

b) Alternative measures of returns[5]

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 the 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. Whereas the industry adjusted return has a slightly larger effect but only makes a marginal difference. As previously stated a 10% increase in total shareholder return will increase median total board pay by £7,150 whilst a 10% increase in total return above the market return will increase pay by £7,025 whilst a 10% return above

[5] 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 industry return will lead to a £8,598.45 rise. For the median highest paid director pay will increase by £3,043 for a 10% increase in total shareholder return but if return is greater then the market by 10% pay will increase by £3033 and for a 10% increase above the industry return pay will rise by £3,565.92. There may be very little effect of the performance of the stock market since we are regressing across all the large firms so the comparisons with other firms may already be compounded in the regression. Or it may be the case, as the majority of past studies have found 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 change over time for both pay variables. Benito and Conyon (1999) found that the pay-performance relationship had strengthened over time in their study of UK firms from 1985-1994 for their sample using the highest paid director. 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 several 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 pretty 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. Though since 2000 the performance elasticities have risen slightly despite the poor performance of the stock market.

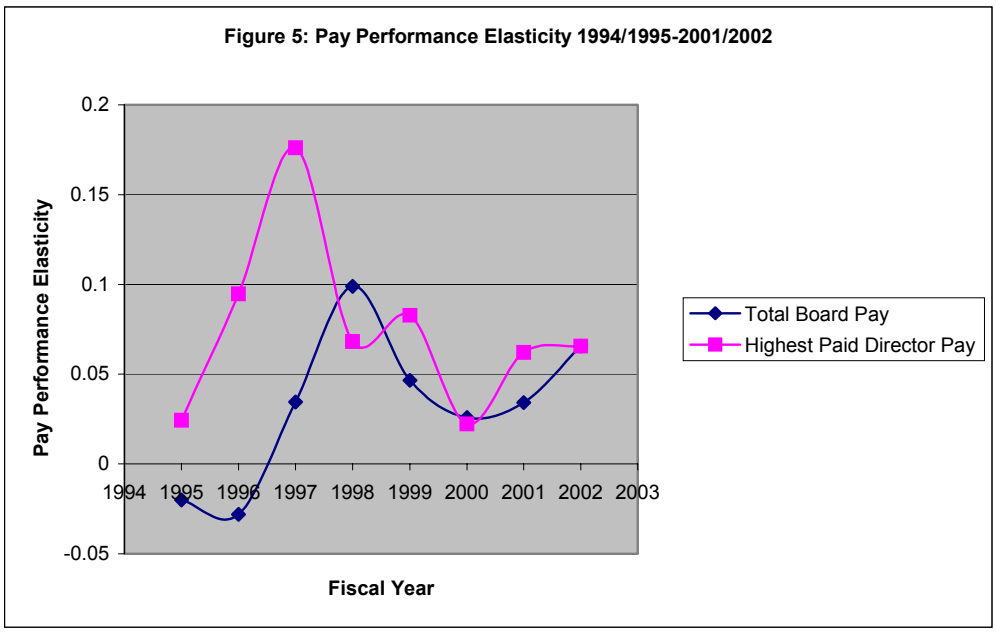

Fig. 5. Pay performance elasticities 1994/1995-2001/2002 obtained from fixed effects regressions.. Pay is cash compensation (salary, bonus and pension contributions) and is inflated upwards to 2001/2002 fiscal year prices. Performance is measured by total shareholder return.

F tests for both pay variables 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 the same 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 or that any relationship we are seeing is due to the volatile performance of the stock market. A caveat to these findings is that the pay variables only include cash compensation and a different picture may arise with the inclusion of other forms of pay such as shareholdings, share options and LTIP's.

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.

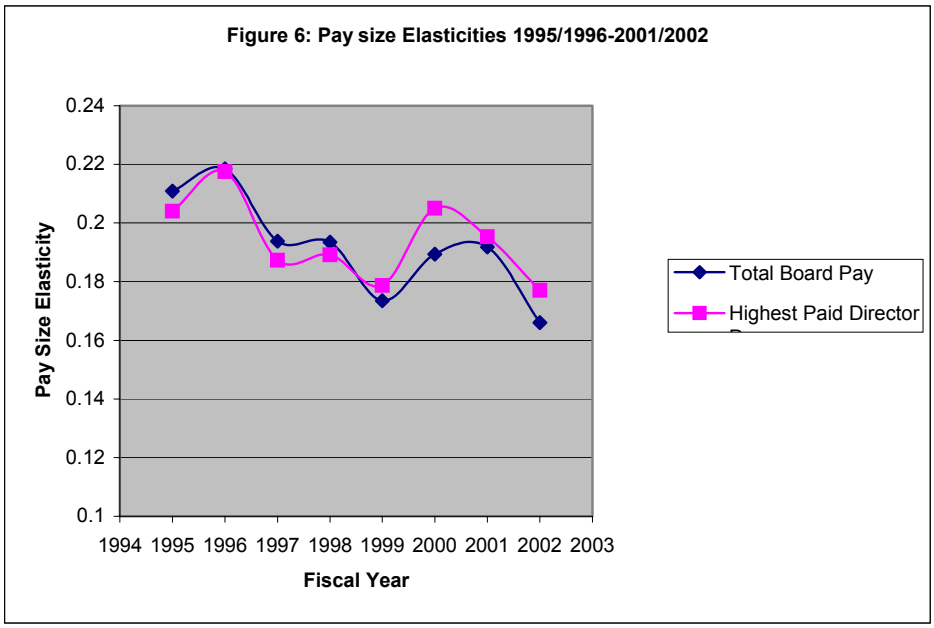

Fig 6. Pay size elasticities 1994/1995-2001/2002 obtained from fixed effects regressions. Pay is cash compensation (salary, bonus and pension contributions) and size is measured by total firm sales. Both pay and sales are inflated upwards to 2001/2002 fiscal year prices.

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. Also Murphy (1999) documented that the pay size relationship had fallen for executive compensation in the US. Girma et al (2003) found that the pay size relationship for CEO's had risen after the Cadbury report (1992) for UK firms.

F-tests for the equality of the coefficients where 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 the coefficients did not change over time for the highest paid director but

did for the total board pay. Therefore the pay size relationship appears to be robust over the sample period for the highest paid director though it did change slightly for the total board pay. The pay size relationship seems more robust then the pay-performance relationship even if it has fallen slightly.

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. These estimates can be found in part d of this section.

Table 4 shows the interactive dummy variables. 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 has crashed. Alternatively this may reflect that firms feel 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) but these studies included incentive pay such as stock options and holdings. .

Past research has explored 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 less 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, 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 table 4. These coefficients show that a firm with the lowest risk (CDF=0) would have pay-performance elasticities of 0.1248 for the total board and 0.1612 for the highest paid director. For a firm with the highest level of risk (CDF=1) the pay-performance elasticities would be equal to 0.0203(0.1248-0.1045) for the total board and 0.0375 (0.1612-0.1237). A firm with median level of risk would have estimates of 0.07255 and 0.09935 for the total board and highest paid director respectively. This demonstrates that firm risk seems to play a role in the different pay-performance elasticities across firms. Even allowing for risk, the pay-performance relationship is still very small but it can be seen that risk does make a difference across pay-performance elasticities. The pay-performance estimate for the lowest risk firm is over six times that of the highest risk firm for total board pay and over four times larger for the highest paid director. The difference between the median and the highest risk firm is much smaller then the difference between the lowest risk firm and

median risk firm. This probably reflects that fact that executives are assumed to be risk averse so require a larger premium for even a small amount of risk!

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. Meta-analysis is commonly used to summarise estimates from a series of studies but nonetheless the techniques will still provide a useful way of averaging across individual firm estimates. For a good description of meta-analysis see Hedges and Vevea (1998) and for an example of its application see 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 the lots of 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 doesn't 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 firstly pooled across whether they had on average over the sample period more then or equal to half their board composing of non-executive directors or less then half. 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 where 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 then the average it doesn't mean they have a higher proportion of non-executives then executives so it is a slightly different measure to the proportion of non-executive directors. Firms who had more non-

executives then the average had a higher pay-performance relationship then those below the average for both total board pay and that of the highest paid director. This suggests that the structure and size of the board does have some bearing 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 future work will incorporate such variables into the definitions of pay. Nonetheless it is still interesting 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 up to 2000. We found that pay-performance elasticities were high when stock returns where high, but that pay is less sensitive to performance when stock returns are low. This suggests that over time there is little relationship between pay and performance. Although the relationship appeared to get stronger after the stock market crash of March 2000. There is some 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 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	First Differences	CAPM	Industry CAPM
	1	2	3	4	5
ln (Total sales)	0.2016	0.2149	0.1357	0.2019	0.2027
	[0.0137]**	[0.0091]**	[0.0197]**	[0.0137]**	[0.0136]**
ln (1 + firm return)	0.0417	0.0429	0.0398		
	[0.0129]**	[0.0129]**	[0.0111]**		
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	-0.1802	-0.4715	-0.4763
	[0.0716]**	[0.0651]**	[0.0766]*	[0.0716]**	[0.0718]**
No of Directors	0.0622	0.0687	0.0234	0.0622	0.0628
	[0.0043]**	[0.0039]**	[0.0049]**	[0.0044]**	[0.0043]**
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	-0.017	4.30	4.29
	[0.1740]**	[0.1157]**	[0.0422]	[0.1739]**	[0.1736]**
Observations	2794	2794	2367	2793	2786
Number of firms	410	410	410	410	410
R-squared	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 pay)

	Fixed Effects	Random Effects	First Differences	CAPM	Industry CAPM
	1	2	3	4	5
ln (Total sales)	0.1979	0.2065	0.1383	0.1981	0.1979
	[0.0161]**	[0.0107]**	[0.0241]**	[0.0161]**	[0.0160]**
ln (1 + firm return)	0.0628	0.0638	0.0408		
	[0.0152]**	[0.0152]**	[0.0136]**		
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	0.0552	0.1583	0.1522
	[0.0847]	[0.0767]**	[0.0940]	[0.0847]	[0.0849]
No of Directors	0.0018	0.0076	-0.0156	0.002	0.002
	[0.0051]	[0.0046]	[0.0060]**	[0.0051]	[0.0051]
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	0.0203	3.27	3.28
	[0.2052]**	[0.1363]**	[0.0517]	[0.2051]**	[0.2049]**
Observations	2790	2790	2364	2789	2782
Number of firms	410	410	410	410	410
R-squared	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

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 [0.0229]**	0.1217 [0.0269]**
	Firms with return below median return in fiscal year	0.0074 [0.0229]	0.0038 [0.0270]
Stock Market Performance	Good stock market performance fiscal year<2001	0.0351 [0.0180]	0.0639 [0.0211]**
	Poor stock market performance fiscal year>2000	0.0499 [0.0204]*	0.0614 [0.0240]*
Firm Size	Firms above median sales	0.0931 [0.0228]**	0.123 [0.0269]**
	Firms below median sales	0.019 [0.0153]	0.0364 [0.0180]*
Firm Risk	ln(1+firm return)	0.1248 [0.0433]**	0.1612 [0.0510]**
	CDF of return standard deviation	-0.1045 [0.0519]*	-0.1237 [0.0612]*

Standard errors in brackets; * Significant at 5%, **significant at 1%

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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