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TOP PAY, COMPANY PERFORMANCE AND CORPORATE GOVERNANCE†

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I. INTRODUCTION

There is still considerable controversy concerning which factors are dominant in shaping the pay of top directors. In particular, public concern has been expressed that the compensation packages received by those at the head of the corporation are not justified by the underlying economic performance of the company in question (e.g. Schneider-Lenne, 1992). Recent academic evidence, too, has found it difficult to isolate a positive relationship between top pay and company performance. Moreover, when such a relationship is identified, the evidence suggests that the link is particularly weak (e.g. Gregg et al., 1993a).†

Not surprisingly, attention has switched to the actual mechanisms by which senior executives are compensated, namely to the putative role played by corporate governance. Although there has been much claimed for the

†Our thanks go to Paul Gregg, Steve Machin, Steve Nickell, Andrew Oswald, Mike Waterson, seminar participants at Leeds and Oxford Universities and an anonymous referee for valuable comments during the preparation of this paper. Also many thanks to Gerry Carlin and John Leahy for sound research assistance throughout the project. The authors gratefully acknowledge funding from the Economic and Social Research Council, the Nuffield Foundation and the Warwick University Research and Innovation Fund.

importance of corporate governance in shaping key economic variables such as directors' pay (e.g. Cadbury Committee, 1992), there has been little direct evidence to substantiate such claims.2

This paper empirically examines the determination of top directors salary using a sample of large UK listed companies between 1983 and 1986. Specifically, we test whether the highest paid directors salary is systematically related to company performance, size and measures of corporate governance. The picture that emerges is quite striking. A positive pay for performance relationship is established but the estimated elasticity is very small. In line with other recent evidence we find that company sales are important in explaining the growth in top pay during the mid 1980's. On the other hand, evidence on the role played by institutional and corporate governance variables is mixed. Whilst ownership control and concentration depress the level of director pay in the sample period, these variables have no effect on the growth in directors pay. Moreover, separating the role of chairman and chief executive, or where the major share holders are insurance companies, has no effect on the level or growth in director pay.

The paper is organized as follows. Section II briefly considers the theoretical aspects of top pay determination. The modelling strategy and data construction are described in Section III. The results of the data analysis, together with a discussion, are presented in Section IV. The paper concludes with a short summary and conclusion.

II. THE DETERMINATION OF DIRECTORS PAY

The factors governing the remuneration of senior executives have recently received much theoretical attention. Typically, models have been developed which demonstrate that compensation received by senior management should be linked to company performance for incentive reasons (see Rosen, 1990). An important element, here, is the design of optimal compensation contracts to elicit appropriate effort by senior management. The typical principal agent framework has the shareholders (principals) delegating decision making authority to managers (agents) whose interests potentially diverge from those of shareholders. The principal's goal is to induce the manager to act in his (i.e. the principal's) best interest, given that an asymmetry of information exists. In this way the design of the optimal contract offered to the agent potentially aligns shareholder and manager interests by generating appropriate incentives.

The nature of the optimal contract offered to the agent will depend on who knows what and when, as well as each party's attitude to risk. Suppose the agent produces an output y, subject to the production function \( y = y(x, \theta) \), where x is effort and \( \theta \) is a random variable with zero mean and known

2 The exception here is the work by Main and Johnston (1993), Main et al. (1991) and Main (1992).
variance. In the example of the shareholder and manager the output of the
chief executive officer can be thought of as the market value of the enterprise.
The principal is assumed to be risk neutral. Agent utility is captured by a
utility function which is concave in consumption and convex in effort. It is
assumed that utility and production functions are common knowledge, but
effort, x, and the random component, θ, are private knowledge to the agent.
Since x and θ are non-separable and individually non-observable by the
principal, the agent receives a share of the output s = s(y). The principal’s
objective is to characterize the optimal contract s(y).

Following Tirole (1988), the agency problem is solved by maximizing the
principal’s objective function subject to two constraints. First, the agent must
willingly engage in the venture with the principal so the agent’s payoff must be
at least as good as some outside alternative. Second, the agent must under-
take costly effort of his own volition. Respectively, these are the participation
and incentive compatibility constraints. Since the agent is risk averse, and
effort is not observed, the appropriate level of effort must be induced through
incentives. Importantly, agency theory predicts that the solution to the
problem has the agent’s compensation increasing with output, or more
generally, with shareholder profit.

In this model there is a conflict between incentives and insurance. If every-
thing was observable, such that θ and x could be disentangled, then the
principal could observe, and verify, agent effort levels. In this case the risk
neutral principal would offer the risk averse agent full insurance, and the
agent would receive a constant wage, independent of the outcome. The agent
would supply optimal effort and verifiable monitoring eliminates malfi-
easance. Since a moral hazard problem is likely, though, the payment
schedule is based on output, and the principal offers less than full insurance
to ensure the agent supplies optimal effort.

Whilst agency models, then, typically predict a positive correlation
between manager compensation and shareholder profit, little can be said
about the shape of the payment schedule (see Rosen, 1990). However,
Holmström and Milgrom (1987) demonstrate that agent compensation takes
a simple linear form, s(x) = a + bx, when income effects are absent in prefer-
ences and random technology shocks, θ, are independent and identically
distributed. Here, the constant ‘a’ represents the insurance aspect and the
slope ‘b’ the power of the incentive component. This is at least a partial
justification for the linear estimating equations which characterize all
empirical studies into the relation between top pay and company perform-
ance (see Abowd, 1990).

As well as these agency considerations, which predict that measures of
shareholder wealth should directly enter the executive compensation
equation, other variables are also potentially important in shaping top pay.
An important candidate variable which has appeared frequently in the litera-
ture is the role of company sales (see Rosen, 1990). Early studies argued that
company size, reflecting managerial preference for absolute firm growth, will
be important in determining executive pay (for example, Cosh, 1975). However, there is another force at work here. Company size may be empirically important in shaping executive pay because the costs of incorrect decisions are vastly greater in large firms than in small ones. Hence, pay may rise more steeply with size because large firms require better managers. However, these two variable reflect the continuing focus of the empirical debate: is it sales or profits (shareholder wealth) that are more important in shaping executive remuneration? Rosen (1990) reviews the evidence and concludes that both company performance and sales are important in shaping top pay.

More recently researchers have focused on the importance of relative performance evaluation in shaping executive compensation (Gibbons and Murphy, 1990). The basic notion is that shareholder wealth alone, such as the market value of the company, may be a noisy signal for managerial effort. In this instance shareholder wealth may be low due to high effort by the executive coupled with bad luck, or simply due to low effort. Since the contract is ideally designed to elicit high effort then rewarding the manager relative to benchmark companies filters out economy/industry-wide noise. It is more difficult for an individual company executive to claim that performance is low due to high effort and bad luck if benchmark companies within the relevant sector are performing well. Agency theory predicts that by including a relative performance measure in the compensation equation this increases the signal to noise ratio.

In addition to these basic variables which are hypothesized to influence top pay, consideration must be given to the role of ownership structure and corporate governance. Lazear (1986) argues that contingent performance based compensation schemes depend crucially on the assumption that direct monitoring of the agent is prohibitively costly. If cheap monitoring technology is available then moral hazard effects may be reduced. In these alternative circumstances both the shareholders and managers might prefer non-contingent compensation systems, such as a fixed salary. Moreover, it suggests an important role for both corporate governance and ownership structure as these may aid monitoring.

Corporate governance refers to the way in which companies are directed and controlled. Ownership structure and shareholder concentration are important dimensions of corporate governance. When company ownership is diverse then a potential for a sub-optimal level of monitoring exists, since an individual shareholder is unable to fully appropriate the gains from the monitoring function (see Vickers and Yarrow, 1988). If ordinary share capital is distributed among many individuals the activity of specifying and enforcing contracts bestows positive value to others. Monitoring activity, here, has the characteristic of a public good. If an individual shareholder carries out the monitoring function alone he bears the full specification and enforcement costs, but in return appropriates only a proportion of the assumed total gain. It may not be possible to exclude other shareholders from reaping the (col-
lectively consumed) rewards of efficacious monitoring. If the marginal increase in expected profit from monitoring activity by individual $i$ is equal to $\Delta \pi$, the individual shareholder receives a gain $\lambda_i \Delta \pi$ where $\lambda_i$ is the proportion of shares owned by individual $i$. For the shareholders when considered together there might be a sub-optimally low level of monitoring (see Vickers and Yarrow, 1988). In such situations managers can have discretion to pursue their own objectives, hence potentially violating the behavioural assumption of expected profit maximization. Dispersed share ownership then alters the incentive structure faced by individual owners. Large variations in ownership implies that the benefits from the actions of managers in terms of shareholder wealth are enjoyed in proportion to the number of shares held. If the individual stake is low as a consequence of share dispersion the incentive to participate in decision making falls. We might expect as ownership concentration increases then corporate behaviour aligns more closely with profit maximization.

The view that dispersed shareholding alone may result in sub-optimal monitoring and hence divergences from profit maximization behaviour by senior management requires some qualification. First, the board of directors can act as an efficient device to specify and enforce managerial contracts. Directors can specify contracts which make pay a function of company performance through bonus schemes or share option plans. This can sharpen incentives, but the effect on pay can be two fold. Individual executives may trade off current pay for shares hence a negative association may be observed between pay and share options. Alternatively, and which seems more plausible, contingent bonus and share plans sharpen incentives and hence raise pay. Furthermore, separating the role of the CEO and chairman may act as a dampening force to managerial discretion. Such points are stressed by the Cadbury committee (1992). Second, for large institutional investors such as insurance companies and pension funds there might exist positive spillover effects from the monitoring of any one management. A reputation for toughness might be established which restricts the discretion of managements in other corporations which the shareholder has an interest in. The marginal benefit from monitoring a given management can then be depicted as: $\Delta \pi^* + \lambda \Delta \pi$ where $\Delta \pi^*$ is the marginal profit increase from other companies in the portfolio. The clear implication is that even if $\lambda$ is small the payoffs from monitoring might not be as sub-optimal as supposed (see Vickers and Yarrow, 1988).

Leech and Leahy (1991) discuss the formulation of a relevant organizational control variable. They argue that the concept of control is the power to

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3 The actual effect of diffuse shareholding is both a theoretical and empirical question. A robust empirical result in the separation of ownership from control literature is that corporations identified as ownership-controlled have higher profits although the quantitative impact is often small and sometimes insignificant. See Leech and Leahy (1991).

4 For example, the very active role played by the California Public Employees Retirement System (CALPERS) in the US might be thought of as such.
exercise judgment and action over important corporate decision making. It has become standard to assume that a corporation is of an ownership controlled type if the largest shareholding exceeds some arbitrarily defined fixed size. In a critique of this approach Cubbin and Leech (1983) demonstrate that it is contingent on the degree of ownership dispersion as measured by the Herfindahl index and the degree of control required. These two contrasting approaches to the issue of ownership are termed fixed and variable classification schemes respectively.

Corporate ownership structure, following Leech and Leahy (1991), can be characterized in two ways. First, as a simple ownership concentration ratio where we denote the continuous variable $C_5$ as the combined holding of the largest five shareholders. The second, as a variable rule control type based on the concentration of voting power using the probabilistic voting model of Cubbin and Leech (1983). In their model control is defined in terms of the likelihood of securing a simple majority in a shareholder vote. The degree of control of a given bloc of large shareholdings is the probability of that bloc being able to secure majority support in any contested vote.

Leech and Leahy (1991) illustrate that the degree of corporate control can be expressed as follows:

$$\alpha_k = \Phi(C_k / |V_k|)$$ (1)

where $\alpha_k$ is the degree of control exercised by the leading $k$ shareholders. The combined holding of the leading $k$ shareholders is $C_k = \Sigma_{i=1}^{k} p_i$, where $p_i$ is the percentage shareholdings in size order such that $p_{i+1}$ for all $i$ and $\Sigma_{i=1}^{k} p_i = 100$. Let $V_k = \Sigma_{i=k+1}^{N} p_i^2$ and the term $\Phi[\cdot]$ is the standard normal distribution function such that if $z \sim N(0,1)$, then $\Pr[z < x] = \Phi(x)$ for any $x$.

The importance of the definition of the degree of control is that it is contingent on both the concentration ratio $C_k$ and the Herfindahl index of concentration, $H$, since the $H$ index can be simply rewritten as $V_k = H - \Sigma_{i=1}^{k} p_i^2$, where $H = \Sigma_{i=1}^{N} p_i^2$. This degree of control has been shown by Leech (1988) to be related to measures of voting power defined for weighted voting games. The interpretation of $\alpha_k$ is straightforward: it is the degree of control exercised by the leading $k$ shareholders. For the largest shareholder we can say that the degree of control of the largest shareholder (which can range from 0 to 100 percent) is:

$$\alpha_1 = \Phi(C_1 / |V_1|) = \Phi(C_1 / (H - p_1^2))$$ (2)

In the empirical work that follows we define the degree of ownership control as a dichotomous variable that exceeds the 95 percent critical value.

III. MODELLING STRATEGY AND DATA DESCRIPTION

To investigate the effects of company performance and corporate governance on highest paid director salary we estimate the following fairly standard first
difference compensation equation:

\[ \Delta \ln(\text{COMP})_{it} = \alpha + \beta \Delta \ln(\text{Shareholder wealth})_{i,t-1} + \gamma \Delta X_{i,t-1} + \delta Z_{i} + \xi_{i} + \epsilon_{it} \]  

(3)

where \( \Delta \) is a first difference operator (so \( \Delta W_{it} = W_{it} - W_{i,t-1} \)) and \( \text{COMP}_{it} \) is a measure of the compensation of the highest paid director in company \( i \) at time \( t \). \( X_{i} \) is a matrix containing company sales and relative performance evaluation measures, and \( Z_{i} \) are company specific corporate governance indicators. \( \xi_{i} \) are year time dummies included to filter out year specific macro-economic shocks, and \( \epsilon_{it} \) is an error term.

Before considering further the measurement of the dependent and independent variables a number of features about equation (3) require discussion. First, the equation considers the effect of the growth in shareholder wealth on the growth in top director compensation. The impact co-efficient \( \beta \) defines the pay for performance sensitivity with higher values of \( \beta \) indicating closer alignment of shareholder and managerial interests (see Jensen and Murphy, 1990). Second, the specification of the growth in top director pay equation is consistent with a levels model which nets out individual firm specific effects from the director pay equation. Hence, the estimated growth in top pay models reported below implicitly purge from the counterpart levels specification those unobserved time invariant features which affect director compensation in firm \( i \). Since we expect that there are many such unobserved company specific factors which may shape top pay which we cannot hope to adequately measure (e.g. managerial style) this methodology represents a considerable advance on simple cross section estimating strategies. Third, since our corporate governance variables are time invariant (see below) equation (3) caters for a potential levels effect of governance on the growth in top director pay. This is consistent with a levels specification of the pay equation which interacts the governance variables of interest with a linear time trend.

We measure \( \text{COMP}_{it} \) as the salary plus bonus of the highest paid director in company \( i \) at time \( t \). This is the only measure of top director compensation that is readily available using UK data and has been used recently by Gregg et al. (1993a) and Conyon and Gregg (1993). Three immediate limitations concerning this variable should be noted. First, the definition of the highest paid director in the company accounts may not coincide with the theoretically relevant unit of observation, namely the chief executive officer (CEO). Second, we cannot isolate separate shareholder wealth effects for the bonus and base salary components of top pay. Third, wider definitions of director pay related wealth are not available in our data set. Such pay related wealth might include the present value of executives stockholding, dividends,

\(^{5}\) Such first difference equations are becoming standard. See Jensen and Murphy (1990) using US data and Gregg et al. (1993b) for the UK case. An important argument for the use of such a specification is that firm specific heterogeneity is accounted for in estimation.
pension entitlements etc. These points notwithstanding the salary plus bonus compensation measure has been widely used in both the UK and US literature and our study is therefore comparable (e.g. Gregg et al., 1993a, b and Jensen and Murphy, 1990).

In this paper we focus on the relationship between top pay and a measure shareholder wealth. There is considerable debate in the literature about which is the appropriate measure of performance to use in top pay equations. Typically, the debate centres around whether accounting or stock market based measures of company performance should be used and examples of both can be found in the literature. Increasingly, stock market measures are being preferred (see Jensen and Murphy, 1990; Gibbons and Murphy, 1992 and Gregg et al., 1993a, b). The intuition is that the optimal contract design has the CEO compensation package tied to variables that the stockholder is interested in, namely the market value of the company (see Rosen, 1990).

We define log shareholder wealth here as ln[(P_t + d_t)/P_{t-1}] * V_{t-1} where P_t is the share price in period t for company i, d_t is its dividend declared at time t and P_{t-1} is the last period share price. V_{t-1} is the market value of the firm at the beginning of the current period. The measure is similar to that used by Jensen and Murphy (1990). In a recent UK study Gregg et al. (1993a, b) estimate the relationship between top pay and shareholder return where shareholder return is measured as ln[(P_t + d_t)/P_{t-1}]. In equation (3) the share- holder wealth variable pre-dates director compensation. This reflects two points. First, executive compensation and shareholder wealth may be jointly determined (see Gregg et al., 1993a). Second, the timing of the impact of company performance on top pay may be potentially important. One way to examine whether managers are actually rewarded for good performance is to consider the time series of company performance and relate this to subsequent variations in managerial compensation. That is there is an important issue of timing in the sense that a managers reward at time t may correspond to his performance and effort levels at previous dates. In a cross section there are many extraneous variables which confound the performance effect on top pay (e.g. Main and Johnson, 1993).

The vector z contains a company size and relative performance evaluation measures. Size is measured as the ln(SALES_{i,t-1}) where SALES is the total sales of firm i, so Δln(SALES_{i,t-1}) is the previous period sales growth. The relative performance evaluation measure that we use is the industry average

Lewellen and Huntsman (1970) find that when such additional elements are incorporated into the construction of the dependent variable there is little qualitative difference in the effect of performance on pay. More recently, Gregg et al. (1993b) using UK data have shown a positive pay and shareholder return relationship when wider measures of CEO pay are used.


shareholder wealth excluding the sample company. The industry unit used here refers to the 2 digit UK stock exchange classification system (see Leech and Leahy, 1991). Relative performance evaluation suggests that (holding firm shareholder return/wealth constant) managerial compensation should be negatively correlated with industry return.

Ownership structure and type variables are included via $Z_r$. The term OC95 is a variable capturing organizational control type in the Cubbin–Leech sense described earlier: the potential ability to control the board of directors. A dichotomous variable OC95 is defined, equal to one if the degree of control of the largest shareholding $\alpha_1$ is greater than 95 percent and zero otherwise. An ownership concentration term is also included. The variable C5 is defined as the combined holding of the largest five shareholders. Dispersed ownership gives individual owners weak incentives to participate in decision making because of public good type effects noted previously. However, a risk averse shareholder with a diversified portfolio may sell his holding if its market value falls too much.

Our data set classifies firms into ownership types and we include the variable INS defined as a dummy variable with a value one if the primary shareholding is by an insurance company or pension fund. We also include another aspect of corporate governance. To capture board characteristics we define the variable SEP which is a dummy variable equal to one if there is a chairman who earns less than the highest paid director. In some instances he will be full time but have a better paid chief executive reporting to him, but in most cases when they are equal this suggests that the role of chief executive and chairman are combined. Hence, as an approximation when SEP = 1 this is taken to imply that the roles of the CEO and chairman are separate. Since the Cadbury Committee (1992) mainly recommended the separation of these functions then potentially it may have an influence in shaping top pay.

Our data set is initially derived from that used by Leech and Leahy (1991) where a full description of data collection is given. The original Leech–Leahy sample consisted of up to 470 firms on some variables. Of these, 323 firms are from the Times 1,000 largest industrial companies. Importantly the selection criterion was based on the availability of share ownership data. To this data set we added a number of other variables. Highest paid director salary was derived as item 244 from Datastream International. We also collected information on company share price and dividends. Information about the nature of corporate governance structure was derived from Charterhouse Top Management Remuneration. The data on ownership and governance structure is time invariant and only available for 1985 in our data set although the pay, sales and company performance data is time varying. To be in our sample a company had to have at least five continuous observations between 1981 and 1986 on the primary variables of interest (executive compensation, sales, and shareholder return). This resulted in an unbalanced panel of 294 companies. Given the construction of the independent variables
and the availability of the governance and ownership indicators, the compensation equations are estimated from 1983–86.

IV. RESULTS

Table 1 provides sample means and standard deviations of the key variables used in our analysis. The data illustrates that the highest directors real pay (salary plus bonus) has a mean value of approximately 77,000 thousand pounds between 1983 and 1986 in 1985 prices. To isolate the growth in real top pay over this period we regressed the log of real top pay on a linear time trend. The resulting coefficient estimate implies that real top pay grew by about 8.5 percent per annum over this period.8 Average shareholder return over this period was approximately 21 percent. The time invariant ownership and governance variables suggest that 22 percent of our sample of companies are ownership controlled in 1985, where the degree of control of the largest shareholding exceeds 95 percent and that combined shareholding of the 5 largest shareholders is approximately 39 percent (see Leech and Leahy, 1991). Approximately 45 percent of companies separate the role of CEO and chairman in 1985. This compares with a figure of 54 percent reported by Conyon (1994) for the year 1988.

In Table 2 the data is analysed further by breaking down real top pay between 1983 and 1986 by the median value of sales, shareholder return, wealth and concentration, as well as governance and ownership characteristics. The table indicates that real pay is higher where shareholder return and sales are high. This is confirmed by the reported regression estimates. These are simply the coefficients from a regression of the level of real top director pay on the variable of interest (including a set of time dummies) over the period 1983 to 1986. The results are broadly in line with agency theory predictions. On the other hand, the level of real director pay is lower in companies that have a higher share ownership concentration or are defined as ownership controlled. Again this is confirmed by the reported coefficient estimates. This is partial evidence that shareholder monitoring, or activism, depresses the level of top pay. On the other hand we find no evidence that the separating the roles of chairman and CEO or whether the majority of shares are held by insurance companies alters the pattern of real pay levels of directors across companies.

A problem with such cross section results is that they can be contaminated by unobserved time constant firm heterogeneities. A stronger test of the pay for performance link, and the power of incentive design, is to consider a first difference model. The results are presented in Table 3. Columns 1 to 3 examine the relation between top pay and shareholder wealth between 1983

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8 The regression (including a constant) had a significant coefficient estimate (standard error) on the time trend of 0.0854 (0.0125).
and 1986 and this is augmented by other potentially important characteristics (company size and relative performance evaluation) in columns 5 and 6.

Earlier we argued that the timing of pay and performance link may be important, hence our shareholder wealth variable pre-date the growth in top pay variable. Furthermore, there is an issue whether it is the previous period level or the growth in shareholder return/wealth which affects the growth in managerial compensation. In the absence of strong priors we test both notions. Column 1 reports the effect of the log of shareholder wealth in \( t - 1 \) on current change in the log of top pay. This is similar to the econometric strategy used by Gibbons and Murphy (1990) who estimate the relationship between the change in CEO pay and the continuously accrued rate of return received by firms shareholders. Similarly, Gregg et al. (1993b) estimate the relationship between the change in the log of director pay and the log of shareholder return. The estimated coefficient in column 1 is positive and significant. Column 2 augments this with the level of shareholder wealth in \( t - 2 \). The restriction that the coefficient estimates on shareholder wealth in \( t - 1 \) and \( t - 2 \) are equal and opposite is accepted, suggesting that it is legitimate to first difference this variable. The result of this exercise is completed in column 3. The estimated coefficient is positive and significant which is consistent with the agency notion that top directors are rewarded for increases in (past) shareholder wealth.

Whilst a positive correlation emerges between top pay and shareholder wealth between 1983 and 1986 the magnitude of the estimated \( \beta \) is very small. A 10 percent increase in shareholder wealth predicts a 0.0059 increase in top director salary plus bonus, other things constant. If this is evaluated at median real top director earnings in the sample (= 66,545 pounds) this corresponds to a small increase in reward of only 375 pounds. This result is completely in line with Gregg et al. (1993a) who estimate a 0.023 elasticity in a sample of UK companies between 1983 and 1988. The evidence forces us to conclude that the pay performance link, and incentive structure examined here, exists but is very weak.

Column 4 augments the growth in top pay equation with lagged company sales. The estimated elasticity is about 7 percent. This differs from previously observed estimates. The survey by Rosen (1990) suggests elasticity estimates of about 20 percent are typical. Our result may have something to with the fact that the sales variable is lagged rather than contemporaneous. To test this idea we estimated the growth in top pay equation using \( \Delta \ln(\text{sales}) \), rather than \( \Delta \ln(\text{sales})_{t-1} \). The resulting estimate (standard error) on this variable was 0.180 (0.027). This elasticity of 18 percent suggests that our results are not too far out of line with previous estimates and that the issue may be about the appropriate timing of the executive pay contract. Column 5 considers the

*Where the log of shareholder return is \( \ln([P_r + d_r]/P_{r-1}) \) and \( P \) and \( d \) are respectively company share price and dividends.

*The test is that coefficient estimate on the \( \ln(\text{shareholder wealth}(t - 1)) - \ln(\text{shareholder wealth}(t - 2)) \). The calculated \( F \) statistic and value is \( F = 1.40 (0.234) \).
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<td>78.92517</td>
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<td>(40.76147)</td>
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<td>(80.44046)</td>
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<td>0.153875</td>
<td>0.261848</td>
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<td>(0.365443)</td>
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<td></td>
<td>(55.4533)</td>
<td>(38.88854)</td>
<td>(64.47858)</td>
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<td>Total sales</td>
<td>298,646.5</td>
<td>319,111.6</td>
<td>317,522.1</td>
<td>338,865.4</td>
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<td></td>
<td>(598,879)</td>
<td>(639,332.9)</td>
<td>(620,814.2)</td>
<td>(746,318.1)</td>
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<td>concentration: C5</td>
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<td>Ownership control: OC95</td>
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<td>0.2048611 (0.403775)</td>
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<td>Separate role of CEO &amp; Chairman in 1985: SEP</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>0.4547284 (0.4981969)</td>
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<td>0.140625 (0.347785)</td>
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**Notes**

**Variable definitions**

1. Real top director pay: this is the highest director salary defined as current salary plus bonus. It is deflated by the CPI (source NIESR) and expressed in 1985 prices. Source: Datastream item 244.

2. Shareholder return: \( \ln(\frac{P_t + d_t}{P_{t-1}}) \) where \( P \) and \( d \) are company share price and dividend respectively. Source: Datastream: SP.

3. Shareholder wealth: \( (\frac{P_t + d_t}{P_{t-1}})^W V_{t-1} \) where \( V \) is the market value of the company. Source: Datastream International.


5. SEP: dummy variable = 1 if chairman earns less than the highest paid director (i.e. separate roles of CEO & chairman). Source: Charterhouse Top Management.

6. INS: dummy variable = 1 if primary shareholding is by an insurance company; OC95: dummy variable = 1 if company is owner controlled (see Leech and Leahy, 1991); C5: combined shareholding of largest 5 shareholders; Sources: Leech and Leahy (1991).

7. A 'c' indicates that the variable is time invariant. Its 1985 value is given in the final column.
<table>
<thead>
<tr>
<th>Variable ((&gt; = \text{or} &lt; \text{median value}))</th>
<th>Mean and standard deviation of top pay</th>
<th>Number</th>
<th>Regression coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholder return (&gt; = 0.2605)</td>
<td>81.08353 (55.308)</td>
<td>576</td>
<td>0.238*</td>
</tr>
<tr>
<td>Shareholder return (&lt; 0.2605)</td>
<td>73.08828 (55.242)</td>
<td>576</td>
<td>(0.088)</td>
</tr>
<tr>
<td>Shareholder wealth (&gt; = 4.5709)</td>
<td>92.85291 (67.552)</td>
<td>576</td>
<td>0.00247*</td>
</tr>
<tr>
<td>Shareholder wealth (&lt; 4.5709)</td>
<td>61.3189 (42.886)</td>
<td>576</td>
<td>(0.00051)</td>
</tr>
<tr>
<td>Real sales (&gt; = 104,439.8)</td>
<td>98.86713 (68.830)</td>
<td>576</td>
<td>0.219*</td>
</tr>
<tr>
<td>Real sales (&lt; 104,439.8)</td>
<td>55.30468 (21.323)</td>
<td>576</td>
<td>(0.0156)</td>
</tr>
<tr>
<td>Shareholder concentration: C5 (&gt; = 0.3389)</td>
<td>62.20665 (36.268)</td>
<td>576</td>
<td>-0.958*</td>
</tr>
<tr>
<td>Shareholder concentration: C5 (&lt; 0.3389)</td>
<td>91.96516 (66.211)</td>
<td>576</td>
<td>(0.152)</td>
</tr>
<tr>
<td>Ownership control: OC95 = 1</td>
<td>68.79366 (44.467)</td>
<td>236</td>
<td>-0.157*</td>
</tr>
<tr>
<td>Ownership control: OC95 = 0</td>
<td>79.22233 (57.707)</td>
<td>916</td>
<td>(0.067)</td>
</tr>
<tr>
<td>CEO &amp; Chairman separate: SEP = 1</td>
<td>76.24487 (65.528)</td>
<td>452</td>
<td>-0.074</td>
</tr>
<tr>
<td>CEO &amp; Chairman separate: SEP = 0</td>
<td>78.25871 (47.862)</td>
<td>542</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Insurance company: INS = 1</td>
<td>89.20433 (58.492)</td>
<td>162</td>
<td>0.137</td>
</tr>
<tr>
<td>Insurance company: INS = 0</td>
<td>75.10289 (54.648)</td>
<td>990</td>
<td>(0.085)</td>
</tr>
</tbody>
</table>

Notes
1. Variable definitions given in Table 1.
2. Sample means & standard deviations of real pay by performance and governance variables. Median values of classification variables are given.
3. Regression coefficient in the final column is the coefficient and Huber (1967) heteroscedastic standard error from a regression of the log of real director pay on the log of the included regressor (if continuous) and a set of time dummies. The estimation period is from 1983 to 1986. An * indicates that the variable is significant at the 5 percent level.
### TABLE 3
Estimates of the Effects of Company Performance on Top Director Pay 1983–86. The Dependent Variable is the $\Delta \ln(salary + bonus)$ of the Top Director

<table>
<thead>
<tr>
<th>Term</th>
<th>Estimate 1</th>
<th>Estimate 2</th>
<th>Estimate 3</th>
<th>Estimate 4</th>
<th>Estimate 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.061281</td>
<td>0.064588</td>
<td>0.078528</td>
<td>0.076890</td>
<td>0.074444</td>
</tr>
<tr>
<td></td>
<td>(0.013802)</td>
<td>(0.013460)</td>
<td>(0.008937)</td>
<td>(0.008858)</td>
<td>(0.008857)</td>
</tr>
<tr>
<td>$\ln(\text{shareholder wealth } (t-1))$</td>
<td>0.006565</td>
<td>0.060132</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003601)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\ln(\text{shareholder wealth } (t-2))$</td>
<td></td>
<td></td>
<td>-0.055683</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.020258)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta \ln(\text{shareholder wealth } (t-1))$</td>
<td></td>
<td></td>
<td>0.059003</td>
<td>0.051949</td>
<td>0.108544</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.02096)</td>
<td>(0.020282)</td>
<td>(0.037518)</td>
</tr>
<tr>
<td>$\Delta \ln(\text{sales } (t-1))$</td>
<td></td>
<td></td>
<td></td>
<td>0.069770</td>
<td>0.069178</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.023249)</td>
<td>(0.023124)</td>
</tr>
<tr>
<td>$\Delta \ln(\text{relative performance } (t-1))$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.066761</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.037440)</td>
</tr>
<tr>
<td>Time dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>37.37 (4)</td>
<td>37.749 (4)</td>
<td>245.879 (4)</td>
<td>244.569 (4)</td>
<td>125.928 (4)</td>
</tr>
<tr>
<td>Wald</td>
<td>3.370 (1)</td>
<td>10.658 (2)</td>
<td>8.621 (1)</td>
<td>17.841 (2)</td>
<td>19.387 (3)</td>
</tr>
<tr>
<td>S1</td>
<td>-2.228</td>
<td>-2.765</td>
<td>-2.725</td>
<td>-2.747</td>
<td>-2.761</td>
</tr>
<tr>
<td>S2</td>
<td>-0.737</td>
<td>-0.675</td>
<td>-0.607</td>
<td>-0.650</td>
<td>-0.610</td>
</tr>
<tr>
<td>Observations</td>
<td>1,112</td>
<td>1,112</td>
<td>1,112</td>
<td>1,112</td>
<td>1,112</td>
</tr>
<tr>
<td>No. companies</td>
<td>294</td>
<td>294</td>
<td>294</td>
<td>294</td>
<td>294</td>
</tr>
</tbody>
</table>

**Notes**
1. The dependent variable is $\Delta \ln(\text{Salary + bonus}) (t)$.
2. Heteroscedastic consistent standard errors in parenthesis. These are the Arellano and Bond (1991) one step standard errors.
3. S1 and S2 are tests for first and second order serial correlation and are distributed $N(0, 1)$. See Arellano and Bond (1988, 1991) for a discussion.
4. Wald is a Wald test for the significance of the included regressors excluding the time dummies and a constant. A Wald test for the significance of the time dummies is reported separately.
role played by relative performance evaluation. The estimated negative coefficient suggests that pay setters take into account industry trends when contracting on top directors pay. The sign is consistent with the notion that common uncertainties shared with similar firms are partially filtered from the top directors reward.

The implicit restriction imposed in Table 3 is that $\delta = 0$ and that company governance and organization control characteristics play no role in shaping the growth in managerial compensation (see equation (3), Table 4 relaxes this restriction.\textsuperscript{11} The effects of shareholder wealth and company sales on the growth in top pay are similar to those established before. However, the relative performance evaluation measure is correctly signed but not significant. In column 1 it turns out that although separating the role of the CEO and chairman in 1985 has a negative effect on the growth in top pay, the effect is completely insignificant. Similarly, the same effect is observed where the main shareholders are insurance companies. Column 2 indicates that ownership concentration plays no role in shaping the growth in the top director pay, in spite of the previously established fact that companies with higher shareholder concentration have lower top pay levels. Column 3 includes the levels of the governance and ownership variables together. A Wald test of the significance of their joint inclusion is rejected (Wald = 3.469 (4)). Taken together these results suggest that the structure of governance and ownership in 1985, captured by the variables included here, play no role in shaping the growth in top director pay between 1983 and 1986. The result is potentially at odds with agency theory. We might expect, for example, that firms which separate the role of CEO and chairman to be less prone to incipient managerialism and hence have lower rates of growth in top pay. We find no evidence for this effect. This contrasts with Main and Johnson (1993) who find that top pay is higher when the chief executive is also the chairman. One potential reason for this anomaly is that the Main and Johnson study examines a crosssection of firms whereas the results here pertain to a panel of companies between 1983 and 1986.

V. CONCLUDING REMARKS

There has been considerable media attention focusing on the high pay awards received by company directors, and allegations that these are not in line with underlying company performance. The results of this paper partially corroborate such fears. Contrary to the predictions of agency theory there is only a weak link between measures of performance and top pay in a sample of 294 UK listed companies between 1983 and 1986. This suggests that the adoption of a contingent performance based contract will have to raise share-

\textsuperscript{11} The number of companies (observations) is reduced to 235 (933). This occurs because of missing data in the ownership structure and governance variables when mapping into the pay, shareholder wealth and sales data.
Table 4
*The Effects of Company Performance and Governance Structure on Top Director Pay 1983–86. The Dependent Variable is: Δln(salary + bonus)*

<table>
<thead>
<tr>
<th></th>
<th>Coefficient (SE)</th>
<th>Coefficient (SE)</th>
<th>Coefficient (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.080877 (0.010514)</td>
<td>0.059992 (0.017241)</td>
<td>0.061170 (0.017036)</td>
</tr>
<tr>
<td>Δln(Shareholder wealth (t−1))</td>
<td>0.094416 (0.037449)</td>
<td>0.093323 (0.037294)</td>
<td>0.091705 (0.037640)</td>
</tr>
<tr>
<td>Δln(Sales (t−1))</td>
<td>0.066219 (0.041029)</td>
<td>0.067517 (0.040945)</td>
<td>0.067193 (0.040792)</td>
</tr>
<tr>
<td>Δln(Relative performance (t−1))</td>
<td>−0.038183 (0.036739)</td>
<td>−0.037769 (0.036415)</td>
<td>−0.036547 (0.036740)</td>
</tr>
<tr>
<td>Separate CEO &amp; chairman in 1985</td>
<td>−0.007981 (0.010218)</td>
<td>-</td>
<td>-0.007722 (0.010512)</td>
</tr>
<tr>
<td>Insurance company in 1985</td>
<td>−0.006920 (0.016000)</td>
<td>-</td>
<td>−0.015805 (0.016114)</td>
</tr>
<tr>
<td>Organizational control: OC95</td>
<td>0.003967 (0.012993)</td>
<td>-</td>
<td>0.004536 (0.013603)</td>
</tr>
<tr>
<td>ln(shareholder concentration) in 1985</td>
<td>−0.014530 (0.012237)</td>
<td>-</td>
<td>−0.018756 (0.012349)</td>
</tr>
<tr>
<td>Time dummies</td>
<td>Yes 75.944 (4)</td>
<td>Yes 21.0425 (4)</td>
<td>Yes 21.214 (4)</td>
</tr>
<tr>
<td>Wald</td>
<td>16.099 (5)</td>
<td>15.340 (5)</td>
<td>18.649 (7)</td>
</tr>
<tr>
<td>S1</td>
<td>−2.419</td>
<td>−2.420</td>
<td>−2.428</td>
</tr>
<tr>
<td>S2</td>
<td>−0.002</td>
<td>−0.036</td>
<td>−0.053</td>
</tr>
<tr>
<td>Observations</td>
<td>933</td>
<td>933</td>
<td>933</td>
</tr>
<tr>
<td>No. companies</td>
<td>235</td>
<td>235</td>
<td>235</td>
</tr>
</tbody>
</table>

Notes
1. The dependent variable is Δln(salary + bonus)(t).
2. The notes to Table 3 apply here.

Holder wealth considerably to affect top pay. The power of the performance base seems particularly weak, reflected in a low estimated elasticity. Similarly, company sales turn out to be an important predictor of top pay, with an estimated elasticity of approximately 7 percent. Moreover, there is some evidence that pay setters take into account relative performance factors. In particular, industry wide noise appears to be filtered from the compensation contract.

On the other hand, the results suggest that the separation of the highest paid director from the chief executive officer, which might potentially reduce managerial slack, has no effect on pay. Similarly, potential monitoring effects
by pension funds and insurance companies turn out to have no effect on the growth in top pay in the mid 1980's. Whilst there is some evidence that ownership concentration type firms have lower levels of top pay in the mid 1980's, there is no evidence that the level of ownership concentration affects the growth in top director pay between 1983 and 1986.

Overall, our results are in line with the recent US literature that shows a weak pay for performance relation. The paper shows, though, that indicators of corporate governance and ownership structure and control are not important in explaining the growth in top director pay in the mid 1980's. This is potentially important since many of the recent policy concerns, expressed for example by the Cadbury Committee, pivot on the efficacy of such institutional structures. The results presented in this paper represent the first steps into an analysis of the ways in which such institutional factors shape executive compensation.

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