

Does the Market for Top Executives Work? CEO Pay and Turnover in Small U.K. Companies

Martin J. Conyon
Daphne Nicolitsas

ABSTRACT. This paper presents the results of our investigation into the operation of the managerial labour market in small and medium sized manufacturing companies. Using a sample of some 40 or so companies we study the sensitivity of managerial pay and tenure to company performance. Managerial pay in this type of firms is much lower than the six digit figures quoted for large public companies and CEO turnover is much higher than we expected. We find some evidence to suggest that pay in small companies is sensitive to sales growth and that CEO tenure in public companies responds to the growth in sales.

1. Introduction

The soaring pay of top executives has caused a public outcry in Britain, and rumblings of discontent in other countries. The real problem is not the **level** of salaries, but their **failure to reflect performance**. The Economist Newspaper, 3 June 1995 (Our emphasis added)

Within the context of a market environment an upward trend in pay could be justified either by an upward shift of the labour demand curve with a constant labour supply curve, or by a shift to the left of the labour supply curve. The supply of suitably qualified managers has probably increased given the proliferation of management training and Business School courses. So the labour supply curve is likely to have shifted to

the right. Thus at least within a certain wage range there is an increase in the number of managers willing to do the job. For the demand curve to have shifted upwards the marginal product of managers must have increased; that is, managers must have become more productive. Managers can increase their productivity either by controlling more resources or by controlling a constant amount of resources more effectively.

We here address the following question: Does the market for top executive work? In order to provide an answer to this we test the twin predictions of the agency model that (i) executive compensation and economic performance are positively correlated and (ii) that poor company performance results in a higher probability of CEO turnover. The former proposition has been tested for both the U.K. and the U.S. using, in general, data for large quoted companies. A recent review of this literature is presented in Conyon, Gregg and Machin (1995).

This paper augments the U.K. empirical literature on the determination of top pay by focusing on executive wage setting in small companies; an area that has received comparatively little attention (an exception is Storey, Watson and Wyncarczyk, 1995). The second innovation herein is the focus on CEO turnover. The influential paper by Jensen and Murphy (1990), based on data for large U.S. firms, illustrates that the discipline provided by the threat of job dismissal acts to align the objectives of managers and owners. They find that management turnover is greater in companies with poor economic performance as predicted by the agency theory. There is, however, a paucity of published evidence on the executive turnover mechanism in U.K. companies. Furthermore, the studies that do exist relate to large rather

Final version accepted on May 1, 1997

Martin J. Conyon
Warwick Business School,
University of Warwick,
Conventry CV4 7AL,
E-mail: martin.conyon@warwick.ac.uk.

and

Daphne Nicolitsas
Institute of Economics and Statistics,
University of Oxford.

than small firms (see Cosh and Hughes, 1995). The current paper hopes to add to the understanding of managerial labour markets by assessing whether managers in small firms are disciplined for poor company performance by increased probability of turnover.

The rest of this paper is organised as follows; Section 2 sets out the framework used in the analysis, Section 3 briefly describes the data used and presents some facts on the issues of interest, Section 4 looks at the relationship between management pay and company size and performance. Section 5 presents information on the relationship between turnover and company performance. Section 6 concludes.

2. A framework for analysis

Theoretical interest in the market for top executives started in the 1960s but only took off recently in the last decade or so following developments in information economics. The best exposition of the issues involved and the development of the appropriate models can be found in Rosen (1990). This section draws heavily on this work to outline the theoretical framework which forms the basis for the empirical analysis.

2.1. The relationship between executive pay and firm size

Starting from the premise that firms are organised in a hierarchical structure with the CEO at the top, Rosen (1990) has shown that executive pay and organisation size are positively correlated since the marginal product of the CEO is reproduced at each lower level. Assuming that the distribution of talent is such that more able individuals are higher up the hierarchy the implications of this structure are that CEO pay is increasing with the span of control at each layer of the hierarchy (s) and the number of layers (n) involved. So, the expectation is that executive compensation and company size are positively correlated reflecting the greater managerial talent of those at the apex of the company (see Rosen, 1990).

In empirical work this hypothesis has been investigated using log-linear regressions of the form.

$$\ln W_{it} = \alpha + \beta \ln x_{it} + \gamma_t + \delta_j + u_i + \eta_{it} \quad (1)$$

where:

i represents the firm, and t the year;

W is CEO real pay;

x represents size measured, in general, by total employment, total real assets or real sales;

γ_t are time dummies to control for aggregate variations;

δ_j are industry dummies to control for factors specific to the industry in which the firm belongs;

u_i are unobservable firm-specific effects; and

η_{it} represents unobservable effects pertaining to both individual firms and time periods.

2.2. The relationship between pay and performance

In modelling the pay of top executives we start with the presumption that managers' effort is unobservable. Thus pay has to be linked with a performance measure which in turn is a function of effort. Thus W , the CEO's pay is a function of some performance measure Y which, in turn, is a function of, *inter alia*, effort (e) and the state of nature (ϵ) (see, *inter alia*, Hart, 1995). Where the 'state of nature' represents both firm-level and industry-wide shocks.

$$W = f(Y); \quad f' > 0 \quad (2)$$

$$Y = \phi(e, \epsilon); \quad \phi'_1 > 0, \phi'_2 ? 0 \quad (3)$$

The idea is that the state of nature affects all firms and thus differences in *relative* performance reveal information about the manager's effort. The issue is more complicated, however, since although it is not possible for a single firm to influence the macroeconomic environment, the level of exposure to different adverse shocks is a management decision. The design of the payment scheme should thus achieve the optimal trade-off between risk and motivation.

In the empirical analysis the interest is in identifying the relationship between pay and performance by estimating equations of the form.¹

$$\ln W_{it} = \alpha_i + \beta_1 \ln v_{i,t-1} + \beta_2 \ln x_{i,t-1} + \gamma_t \times t + \delta_j \times t + u_{it} \quad (4)$$

where:

α_i represents firm-specific unobservable fixed effects;

$v_{i,t-1}$ represents some measure of performance (e.g. profits per employee, accounting rates of return, shareholder rate of return, sales, firm profits relative to industry profits);

$x_{i,t-1}$ measures size, u_{it} represents unobservable effects pertaining to both individual firms and time periods. The rest of the variables are as in equation (1) above.

The performance and size variables are lagged by a year since we are interested in the sensitivity of remuneration to *past* achievements whereas the current value of size and performance is likely to be endogenous. That is, corporate performance could also be affected by pay. Additionally, since it is likely that the pay of the CEO is decided before the end of the current financial year this provides an additional rationale for using lagged right hand side variables.

2.3. The relationship between turnover and performance

The relationship between pay and performance is only one way by which the shareholders can motivate management. Since, as noted in the introduction, the evidence for the U.K. suggests that the link between compensation and performance has been at best weak, this has led to concerns that the incentive structure faced by managers at leading U.K. companies in pursuing shareholders interests may not be effective. It is, however, possible to regulate management behaviour by other means. More specifically the owners could monitor management by making tenure a function of past performance.

The proposition under scrutiny then is whether good performance is rewarded by re-electing the CEO and, *vice versa*, whether bad company performance leads to replacement of the CEO. In other words the issue is whether the threat of dismissal could act as a discipline device (see Jensen and Murphy, 1990; Weisbach, 1988).

A basic model is thus of the form:

$$\Pr(\Delta CEO_{it}) = F(x\beta) = \frac{\exp(x\beta)}{(1 + \exp x\beta)} \quad (5)$$

where:

ΔCEO_{it} indicates the presence or otherwise of a new CEO;

The x vector includes a measure of average firm performance during the last p periods;

$\sum_{m=1}^p \frac{\Delta_{v,t-m}}{p}$, and CEO characteristics, q_{kt} , some of which are time invariant (e.g. date of birth, nationality) and some of which are time varying (e.g. alternative appointments, education).

The expected sign on the performance measure is negative. That is good performance is rewarded by re-electing the current CEO and bad performance is 'punished' by bringing in a new CEO.

Sections 4 and 5 use the data described next to test the above hypotheses.

2.4. Some recent evidence on pay and turnover

Below we present a succinct review of some of the recent evidence, predominantly for the U.K., on executive compensation and management turnover to set the context within which to place our results.

Canyon, Gregg and Machin (1995) review some of the recent evidence on directors' pay in relation to corporate governance. Most of the studies reviewed relate to samples of large quoted companies. The main conclusion is that the estimated link between compensation of the highest paid director and market measures of company performance is small. For instance, Gregg, Machin and Szymanski (1993) using a sample of 288 U.K. quoted companies find an elasticity of pay to shareholder returns of 0.03 for the period 1983–88. Whereas for the same sample of firms over the period 1989–91 this elasticity is zero. The results appear consistent with the U.S. evidence. The influential paper by Jensen and Murphy (1990) also reports a low sensitivity of pay to company performance; CEO wealth increases by \$3.25 for every \$1000 increase in shareholder wealth.

One of the disadvantages of the above studies is that stock options held by directors are *not* included in the measure of compensation. This could be biasing the relationship between pay and performance downwards as Main, Bruce and Buck (1996) show. Using data on 60 large companies from the 1990 FT-SE 100 index they find that management remuneration is more sensitive to performance when the former is defined as to include the value of options.

There are only a few studies of executive

compensation in small U.K. firms. Storey et al. (1995) examine the remuneration of 97 non-owner managers in U.K. unquoted and unlisted securities market enterprises (USM) for the late 1980s. Their cross-section regression results indicate that company performance, measured as average pre-tax profits to total assets between 1985–88, is not significantly related to director remuneration. Their study indicates that human capital variables (age, qualifications and experience) and firm size are the most important determinants of executive salaries.

On the issue of management turnover the existing U.S. literature in general concludes that executive turnover and company performance, in large firms are negatively related. Jensen and Murphy (op. cit.) find that among 1,896 CEOs serving in 1092 *Forbes* companies, between 1974 and 1986, the correlation between CEO turnover and the current and lagged, net of market, shareholder return is significantly negative. Similar results are reported in other U.S. studies, see, *inter alia*, Weisbach (1988) and Warner, Watts and Wruck (1988). Some recent research for the U.K. also bears out this hypothesis. Cosh and Hughes (1995) analyse 64 companies in the U.K. electrical engineering industry between 1989–94. They find that CEO dismissal is negatively related to company performance as measured by either relative shareholder return or the profit to asset ratio. Similarly, Conyon (1996) finds that CEO turnover is negatively related to shareholder return in a sample of large U.K. companies in the late 1980s and early 1990s.

The results presented below examine executive pay and dismissal in small and medium sized companies for which little evidence exists.

3. The data

The data used in the analysis are from some 40 small to medium sized manufacturing companies for the period 1985–92. The firms belong to the following 5 sectors; engineering, electronics, plastics, food and drink and a miscellaneous sector. Firms have been chosen from a sampling frame of manufacturing companies producing fairly homogeneous products and not operating at a multitude of sites. The firms selected are those which participated in a separate extensive survey on organisational structure.

We should stress at this point the longitudinal nature of the data. For each individual company we have collected from its annual report information for a number of years. This contrasts to previous small firm studies of directors' remuneration which have used a cross section of data for a particular year. For our study the collection of standard economic data (e.g. remuneration and sales) was comparatively straightforward using the company accounts over various years. The construction of the CEO turnover variable was considerably more labour intensive, however, since it involved identifying the management team and defining a variable for turnover based on *changes* through time.

The distribution of firms into sectors together with the characteristics of the firms by sector in terms of employment and sales are given in Table I. Since the panel is not balanced that is, the number of firms is not the same in every year, we present firm characteristics in one year, 1988.

Most of the firms belong to either engineering or plastics but about 30% of the firms belong to

TABLE I
Characteristics of the sample in 1988

Sector	% of total sample	Median employment	Median Sales (£'000s)
Engineering (21)	44.7	226	8315
Electronics (3)	6.4	117	4454
Plastics (12)	25.5	310	21040
Food & drink (4)	8.5	686	47519
Miscellaneous (7)	14.9	577	31740
Complete sample	100	255	13347

Notes: The numbers in brackets next to the industry description represent the number of firms in each industry.

Source: Company Accounts.

other sectors so this is by no means a case study of the engineering and plastics industries.

The median pay for the highest paid directors for these companies over the period 1985–92 is presented in Table II. Pay is here defined as the amount disclosed in the firms' accounts as remuneration of the highest paid director. This is a sum of salary and bonus but excludes pension contributions and share options. Share options in companies of this size, however, are much less important than in the big public FT-SE companies used in most other studies.

The second column of Table II shows the median change in real pay for each year. These changes are in contrast with the picture of 'soaring pay' for top executives in *big* firms described by *The Economist* and quoted in the Introduction to this paper. It also appears that pay changes might be following the business cycle. Increasing from 1986 to 1988; the peak of the boom, and falling thereafter with the onset of the recession until 1992 when pay picks up again. This differs from the evidence presented in Conyon, Gregg and Machin (1995) which suggests that pay in large companies did not fall in the latest recession.

The third column of Table II presents the ratio of pay over sales and indicates that CEO salaries are indeed a very small share of company sales. Thus over the period 1985–92 CEO pay represents, on average, only 0.45% of sales. The last column of Table II shows the extent of CEO turnover. The figures show the percentage of firms in which there was a change in CEO; so, for example, in 1985 there was a change of CEO in

12.1% of firms. The figures vary substantially over time and, although the time period covered is fairly short, they suggest that CEO turnover might be following the business cycle but contrary to the pay figures this is countercyclical. Thus turnover appears to be declining until 1988 and is then on an increase up to 1991.

It has to be emphasized at this point that although the companies in our sample are small and thus the monitoring of management by the owners is easier, managers do not coincide with the owners. The average percentage of shares held by the CEO is around 10%.

The next sections use the data described here to test the hypotheses put forward in Section 2. That is we test whether pay and turnover are influenced by corporate performance.

4. The relationship between executive pay, firm size and performance

The median pay of the highest paid directors in the firms used in this analysis is lower than those for big listed companies in the U.K. Gregg et al. (1983) report that for the FT-TOP 500 companies the median pay of the highest paid director in 1990 prices is £85,000 in the period 1982–84, £115,000 in 1985–87 and £176,000 in 1988–91. These figures are over twice those quoted in Table II. This is expected given that firm size and directors' pay are positively related.

Estimates of the elasticity of pay with respect to size (x), measured by either employment (N), real fixed assets (A) or real sales (S), that is, the

TABLE II
Pay and turnover of highest paid directors

Year	Median pay in 1990 prices £	Median change of real pay %	Median ratio of pay over sales %	Turnover %
1985	49,594	—	0.552	12.1
1986	51,567	3.65	0.518	17.9
1987	54,181	5.75	0.411	8.5
1988	56,842	5.97	0.395	6.4
1989	58,153	4.35	0.439	12.5
1990	59,259	−0.50	0.385	17
1991	55,616	0.53	0.369	22.2
1992	61,005	5.24	0.576	18.9

Notes: Pay has been deflated by the Retail Price Index (RP1).

Sources: (i) Company Accounts (ii) Economic Trends Annual Supplement, 1994 edition, Table 2.1 for RP1.

coefficient β in a log-linear regression of pay on size of the form of equation (1) confirm this result for our sample.

$$\ln W_{it} = 7.464 + 0.244 \ln N_{it} \\ (10.42) \quad (4.42)$$

$$\ln W_{it} = 8.958 + 0.202 \ln A_{it} \\ (28.06) \quad (5.48)$$

$$\ln W_{it} = 7.917 + 0.274 \ln S_{it} \\ (17.17) \quad (5.97)$$

All the above equations include industry and time dummies. Details on the estimation procedure followed are relegated to Section B of the Appendix. The results suggest that a 10% increase in employment is associated with an increase in pay of the order of 2.4%, a 10% increase in fixed assets predicts an increase in pay of about 2% and 10% increase in sales is associated with an increase in pay of the order of 2.7%. The existence of this positive relationship and the magnitude of the elasticity corroborate the result reached in almost all empirical studies on this issue (Rosen, op. cit.; Milgrom and Roberts, 1992).

As noted above the existing evidence on the relationship between pay and performance for both

the U.K. and the U.S. indicates that, in general, there is a positive but not very strong link. Using the data described in Section 3 we estimate equation (4) using real sales ($\ln S_{i,t-1}$) and real profits per employee $(\Pi/N)_{i,t-1}$ as performance measures. Although equation (4) was specified in levels we estimate it in first differences to eliminate the individual firm effects, the α_i s. The estimated equation is thus the following:

$$\Delta \ln W_{it} = \beta_1 \Delta \ln v_{i,t-1} + \beta_2 \Delta \ln x_{i,t-1} \\ + \gamma_t + \delta_j + \Delta u_{it} \quad (6)$$

where:

Δ is the difference operator such that: $\Delta y_{it} = y_{it} - y_{i,t-1}$

The results are reported in Table III. The estimates are produced using the Arellano and Bond (1988) DPD package. As is well known the first difference of a levels model, which contains fixed effects, and has a white noise error structure, results in an induced MA(1) process. Under the null of the correct specification of the model in levels we would, therefore, expect to observe first but not second order serial correlation. The reported diagnostic test confirms the null of no

TABLE III
Pay regressions

Independent variables	Dependent variable: $\Delta \ln W_{it}$, sample period: 1987–92			
	Growth in real sales		Change in profits per employee	
	(1)	(2)	(3)	(4)
$\Delta \ln S_{i,t-1}$	0.154 (1.25)	0.145 (1.17)	–	–
$\Delta (\Pi/N)_{i,t-1}$	–	–	0.00276 (0.86)	0.00261 (0.87)
$\Delta \ln A_{i,t-1}$	0.115 (0.88)	0.100 (0.79)	0.146 (1.21)	0.128 (1.11)
Turnover _{it}	–	–0.0764 (1.32)	–	–0.0794 (1.41)
Time dummies	✓	✓	✓	✓
Number of firms	39	39	39	39
Number of observations	193	193	193	193
se/ $\ln w_{it}$	0.0208	0.0208	0.0209	0.0209
2nd order auto. ($n(0, 1)$)	–0.97	–0.86	–1.24	–1.11

Notes:

1. S_i = real sales; $(\Pi/N)_i$ = real profits per employee in thousands of pounds; A_i = real fixed assets; Turnover_i is equal to 1 if new CEO, 0 otherwise.
2. All regressions include a constant term.
3. Absolute t -statistics, calculated from heteroscedastically consistent standard errors, are reported in brackets below the coefficient estimates.
4. Equations have been estimated using the Arellano and Bond DPD package.
5. Industry dummies have not been included since they were not jointly significant.

second order serial correlation in any of the models.

Column (1) of Table III shows the coefficient estimates from a regression of the percentage change in real pay on the growth rate of sales lagged by a year. The coefficient is not significantly different from zero. In column (2) we introduce a dummy variable (Turnover) to indicate the presence of a new director. The rationale is that new directors could start from a salary lower than that of departing directors to compensate for their lack of experience in the specific post and firm. The coefficient on the growth rate of sales, however, is still not significant. The turnover variable shows in with the expected negative sign but is not very significant. Columns (3) and (4) report the results from estimating the same specification as in columns (1) and (2) but with the change in the profits per employee variable as the performance measure. Again, the point estimates have the expected signs but are not statistically significant. These initial estimates appear consistent with those reported by Storey, Watson and Wyncarczyk (1995) who in a cross-section regres-

sion of pay on average profits find that the latter is statistically insignificant.

However, it is possible that top management pay is based on different factors in publicly owned firms and in privately owned firms. This could be so since, in general, ownership of public firms is more dispersed and thus monitoring of managers effort more difficult. Hence, linking pay with profits might provide an appealing monitoring device for shareholders of public companies.

To investigate this hypothesis we interact the performance measure with the ownership status variable. The results are reported in columns (1) and (3) of Table IV. The coefficient on the sales variable is again not significant, the profits variable, however, shows some variation in the behaviour of private and public firms. An increase in profits appears to lead to an increase, if only marginally significant, in pay in public firms whereas it has no impact in private firms. The result is consistent with our hypothesis.

Furthermore, it might be the case that objectives of small and large firms differ. Assuming that the objective of managers in small firms is to

TABLE IV
Pay regressions with performance interactions

Independent variables	Dependent variable: $\Delta \ln W_{it}$, sample period: 1987–92			
	Growth in real sales		Change in profits per employee	
	(1)	(2)	(3)	(4)
$\Delta \ln S_{i,t-1} \times \text{public}$	0.0295 (0.325)	–	–	–
$\Delta \ln S_{i,t-1} \times \text{private}$	0.283 (1.37)	–	–	–
$\Delta \ln S_{i,t-1} \times \text{big}$	–	–0.0827 (0.93)	–	–
$\Delta \ln S_{i,t-1} \times \text{small}$	–	0.424 (2.57)	–	–
$\Delta(\Pi_i/N_i)_{t-1} \times \text{public}$	–	–	0.00738 (1.78)	–
$\Delta(\Pi_i/N_i)_{t-1} \times \text{private}$	–	–	–0.00771 (1.05)	–
$\Delta(\Pi_i/N_i)_{t-1} \times \text{big}$	–	–	–	0.00185 (0.12)
$\Delta(\Pi_i/N_i)_{t-1} \times \text{small}$	–	–	–	0.00304 (1.19)
$\Delta \ln A_{i,t-1}$	0.106 (0.84)	0.123 (1.00)	0.120 (1.00)	0.127 (1.07)
Turnover _{it}	–0.0869 (1.41)	–0.0838 (1.42)	–0.075 (1.37)	–0.0796 (1.45)
Time dummies	✓	✓	✓	✓
Number of firms	39	39	39	39
Number of observations	193	193	193	193
se/ $\ln w_{it}$	0.0208	0.0207	0.0209	0.0209
2nd order auto.	–0.57	–0.32	–1.69	–1.079

Notes:

1. A firm is classified as big if its average employment over the sample period is equal or above the median (median employment = 250). Also see notes to Table III.

increase their market share and thus that their target, at least in the short-run, is sales maximisation, managers should be rewarded for achieving an increase in sales. To study this hypothesis we introduce interactions of each of the performance measures with a dummy variable for size. In other words, the hypothesis tested is that the coefficient β_1 in equation (6) differs between big and small firms.

Columns (2) and (4) of Table IV indicate that the coefficients on the growth rate of sales variable are indeed very different in big and small firms. Whereas in big firms there is no discernible effect from an increase in the growth rate of sales on managers pay, in small firms a 10% increase in sales leads to a 4% increase in pay. On the other hand, the coefficient on the change in profits variable does not appear to be significant for either type of firm.

We also experimented with two measures of relative performance; namely, the ratio of labour productivity in the firm over labour productivity in the 4-digit industry in which the firm belongs and the ratio of profits per employee in the firm over profits per employee in the industry in which the firm belongs. The results did not support the hypothesis of a relationship between these measures of relative performance and our pay measure (the results are available on request from the authors).

5. The relationship between CEO turnover and company performance

The dependent variable in equation (5) indicates a change or otherwise of the person serving as CEO. Thus a 0 indicates that the CEO in period t is the same as in period $t - 1$. Data on q_{kt} , CEO characteristics, are unfortunately not available thus we will here focus on performance.² This is consistent with Jensen and Murphy (1990) and Weisbach (1988). We used a logit model in estimating this 'restricted' version of equation (5) and the marginal effects from this estimation are drawn together in Table V.

Table V suggests that there is some, albeit not statistically significant, negative link between average change in sales and profits in the last two years and the change in CEO. In other words, a deterioration in performance is likely to lead to

TABLE V
Turnover regressions

Dependent variable: ΔCEO_{it} , sample period: 1988–92		
Independent Variables	Growth in real sales (1)	Change in profits per employee (2)
$\frac{\Delta \ln S_{i,t-1} + \Delta \ln S_{i,t-2}}{2}$	-0.280 (1.16)	– –
$\frac{\Delta \left(\frac{\Pi_i}{N_i} \right)_{t-1} + \Delta \left(\frac{\Pi_i}{N_i} \right)_{t-2}}{2}$	– –	-0.0118 (0.80)
Number of firms	39	39
Number of observations	154	154

Notes:

1. ΔCEO_{it} is equal to 1 if there is a new CEO in period t and 0 otherwise; $\Delta \ln S_{i,t-j}$ = % change in real sales in period $t - j$; $\Delta \left(\frac{\pi_i}{N_i} \right)_{t-j}$ = change in real profits per employee in period $t - j$ in thousands of pounds.
2. The entries in the table are marginal effects.
3. Absolute t -ratios in brackets below marginal effects.
4. Regressions have been estimated using STATA 4.0.

replacement of the CEO. These results are consistent with those reported in Cosh and Hughes (1995) and Conyon (1996).

Turning next to variations of the coefficient β in equation (5) across firms with different ownership status and size, the results reported in Table VI support the hypothesis that the coefficients differ. In public firms a decrease in the rate of growth of sales increase the probability of CEO displacement. That is, CEO removal as a discipline mechanism is more effective in companies which conform better to the principal-agent paradigm. The interactions of firm type with the change in profits variable also point in the same direction but the coefficients are not precisely estimated.

6. Conclusions

This paper addresses the question: does the market for executives work? We consider two related questions: First, whether the remuneration of executives is related to the performance of their companies. Second, whether managers in poorly performing companies are disciplined by increased probability of dismissal.

Our investigation of the operation of the man-

TABLE VI
Turnover regressions with ownership and type interactions

Independent variables	Dependent variable: ΔCEO_{it} , sample period: 1988–92			
	Growth in real sales		Change in profits per employee	
	(1)	(2)	(3)	(4)
$\frac{\Delta \ln S_{i,t-1} + \Delta \ln S_{i,t-2}}{2} \times \text{public}$	-0.678 (2.028)	—	—	—
$\frac{\Delta \ln S_{i,t-1} + \Delta \ln S_{i,t-2}}{2} \times \text{private}$	0.172 (0.53)	—	—	—
$\frac{\Delta \ln S_{i,t-1} + \Delta \ln S_{i,t-2}}{2} \times \text{big}$	—	-0.345 (1.07)	—	—
$\frac{\Delta \ln S_{i,t-1} + \Delta \ln S_{i,t-2}}{2} \times \text{small}$	—	-0.188 (0.54)	—	—
$\frac{\Delta \left(\frac{\Pi_i}{N_i}\right)_{t-1} + \Delta \left(\frac{\Pi_i}{N_i}\right)_{t-2}}{2} \times \text{public}$	—	—	-0.0464 (1.35)	—
$\frac{\Delta \left(\frac{\Pi_i}{N_i}\right)_{t-1} + \Delta \left(\frac{\Pi_i}{N_i}\right)_{t-2}}{2} \times \text{private}$	—	—	0.0129 (0.55)	—
$\frac{\Delta \left(\frac{\Pi_i}{N_i}\right)_{t-1} + \Delta \left(\frac{\Pi_i}{N_i}\right)_{t-2}}{2} \times \text{big}$	—	—	—	-0.0434 (1.34)
$\frac{\Delta \left(\frac{\Pi_i}{N_i}\right)_{t-1} + \Delta \left(\frac{\Pi_i}{N_i}\right)_{t-2}}{2} \times \text{small}$	—	—	—	-0.00451 (0.34)
Number of firms	39	39	39	39
Number of observations	154	154	154	154

agerial labour market in medium sized manufacturing companies suggests that there is indeed a positive link between performance and pay and that this relationship is stronger in smaller companies. There is evidence of a weak link between pay and performance in public companies. The results are consistent with those found in studies of the determination of executive pay in large companies. The results are also consistent with the emerging evidence on the operation of managerial labour markets in small companies (see for example Storey *et al.*, 1995).

In terms of turnover our evidence suggests that managers in public companies face an increased probability of dismissal following poor past company performance as measured by a decrease in the rate of growth of sales. This suggests that bad performance is reflected in removal of the CEO rather than changes in pay.

Acknowledgement

We are grateful to Marc Cowling and participants in seminars at the British Academy of Management Conference, 1995 and the Royal Economic Society Conference, 1996 for useful comments and suggestions.

Appendix

A. Data Appendix

A.1. Definitions and sources of variables used

1. *W Pay* here is defined as the amount disclosed in the firm's accounts as remuneration of the highest paid director. This is a sum of salary and bonus but excludes pension contributions and share options. Pay has been deflated using the Retail Price Index.

Source: Company Accounts for nominal pay and Economic Trends Annual Supplement 1994 edition, Table 2.1 for price deflator.

2. N : Employment total average employment in the financial year.
Source: Company Accounts.
3. A : Real fixed assets: Book value of fixed assets deflated by the retail price index.
Source: Company Accounts for nominal fixed assets and Economic Trends Annual Supplement 1994 edition, Table 2.1 for price deflator.
4. S : Real sales: Company sales deflated by the Producer Price Index for the 4-digit industry in which the company belongs.
Sources: Company Accounts for nominal sales and Business Monitor M22 (various issues) for price deflator.
5. Π : Profits before tax deflated by Retail Price Index.
Source: Company Accounts for nominal profits and Economic Trends Annual Supplement 1994 edition, Table 2.1 for price deflator.
6. ΔT_i : Variable takes the value 1 if CEO is continuing in office (i.e. has not changed from last year) and 0 otherwise.
Source: Directors' Report in Company Accounts.

A.2. Descriptive statistics

TABLE VII
Descriptive statistics

Variable	Mean	St. dev.
Public	0.45	0.5
Π_t/N_t in £000	4.54	11.74
$\Delta(\Pi_t/N_t)$ in £000	0.24	3.53
$\ln S_t$	9.37	0.93
$\Delta \ln S_t \times 100$	5%	16.1
$\ln W_t$	10.74	0.42
$\Delta \ln W_t \times 100$	2.29%	33.56

B. Estimation

The pay-size regressions on page 6 have been estimated using a random effects model. So instead of treating the firm-specific effects as fixed constants we treat them as random variables. This estimation method gives more efficient estimates than the fixed-effects model. If, however, the firm-specific effects are correlated with the explanatory variables then the random effects estimates are biased. We use the Hausman diagnostic to test the hypothesis that the firm-specific effects are correlated with the regressors. This indicates that the firm-specific effects are not correlated with the regressors and thus the random effects specification is valid.

Notes

¹ See, *inter alia*, Conyon, Gregg and Machin, 1995; Jensen and Murphy, 1990; Rosen, 1990.

² We estimated the equations below for a very small subsample for which the age of the director was available and we find no significant correlation between age and turnover; for example in a logit equation of turnover on profits and age of the director lagged by a period the coefficient on the latter variable is of the order of 0.11 with a t-statistic of 0.4. The coefficients on the other variables in this regression were also insignificant which is to be expected given the sample size.

References

- Conyon, M. J., 1996, *Directors' Pay and Turnover: An Application to a Sample of Large U.K. Firms*, University of Warwick, mimeo.
- Conyon, M. J. and P. Gregg, 1994, 'Pay at the Top: A Study of the Sensitivity of Top Director Remuneration to Company Specific Shocks', *National Institute Economic Review* **149**(3), 83–92.
- Conyon, M. J., P. Gregg and S. Machin, 1995, 'Taking Care of Business: Executive Compensation in the U.K.', *Economic Journal* **105**(430), 704–714.
- Cosh, A. and A. Hughes, 1995, *Executive Remuneration, Executive Dismissal and Institutional Shareholdings*, Centre for Business Research, University of Cambridge, Working Paper No. 19.
- The Economist, 1995, Vol. 335, London.
- Gregg, P., S. Machin and S. Szymanski, 1993, *The Compensation of Top Directors of U.K. Companies*, University College London, mimeo.
- Hart, O., 1995, 'Corporate Governance: Some Theory and Implications', *Economic Journal* **105**(430), 678–689.
- Jensen, M. and K. Murphy, 1990, 'Performance Pay and Top Management Incentives', *Journal of Political Economy* **98**(2), 225–264.
- Main, B., 1992, *Top Executive Pay and Company Performance*, University of Edinburgh, mimeo.
- Main, B., 1993, 'Pay in the Boardroom: Practices and Procedures', *Personnel Review* **22**, 3–14.
- Main, B., A. Bruce and T. Buck, 1996, *Total Board Remuneration and Company Performance*, University of Edinburgh, mimeo.
- Milgrom, P. and J. Roberts, 1992, *Economics, Organisation & Management*, New Jersey: Prentice-Hall International.
- Rosen, S., 1990, *Contracts and the Market for Executives*, National Bureau for Economic Research Working Paper No. 3542.
- Tirole, J., 1988, *The Theory of Industrial Organization*, Cambridge, MA: MIT Press.
- Storey, D., R. Watson and P. Wyncarczyk, 1995, 'The Remuneration of Non-owner Managers in U.K. Unquoted and Unlisted Securities Market Enterprises: An Empirical Analysis of Firm Specific, Human Capital and Job History Influences', *Small Business Economics* **7**, 1–13.
- Warner, J. B., R. L. Watts and K. H. Wruck, 1988, 'Stock Prices and Top Management Changes', *Journal of Financial Economics* **20**, 461–492.
- Weisbach, M., 1988, 'Outside Directors and CEO Turnover', *Journal of Financial Economics* **20**, 431–460.

Copyright of Small Business Economics is the property of Springer Science & Business Media B.V. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.