

Privatization and Management Incentives: Evidence from the United Kingdom

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Abstract

This paper examines whether privatization affects management incentives and provides an estimate of the magnitude of the change. Using data from large firms in the United Kingdom, we find no relationship between compensation and financial performance in state-owned firms, both before and after corporate governance reforms. In contrast, we find a strong sensitivity in privatized firms both immediately and in more mature privatized firms driven largely by stock options and shareholding. For more mature privatized firms, compensation and dismissal sensitivities are complementary with our estimates suggesting a 443,000 pound increase in management returns for a one standard deviation improvement in firm performance. This estimated incentive intensity is higher than in established publicly traded firms. Our results support the theoretical focus on incentives in the dominant theories of state and private ownership.

1. Introduction

Theories differ on the impact of ownership on incentives. One view is that the form of ownership shouldn't matter because the incentives that exist under private ownership can be replicated under state ownership with the appropriate contract. In both state-owned and private firms there is a separation of ownership and control and the tools to align interests are available to owners in both types of firms (Laffont and Tirole, 1993). A second view is that the form of ownership is central; managers of state-owned firms are not owners and get only a fraction of returns and state owners are thought to be unwilling to use incentives tied to performance so that politicians are free to use firms to address other goals (Alchian, 1977, Boycko, Shleifer and Vishny, 1996, Shleifer and Vishny, 1998).

Links between ownership and incentives are particularly important in the privatization debate. As the scholars on UK privatization John Vickers and George Yarrow assert, "*the central implication of the analysis ... is that privatization is likely to improve social welfare only if it provides significantly keener managerial incentives than does the control system for public enterprise.*" (1988: 39)¹ If firm performance could be ensured or improved under state ownership through proper incentives then the justification for privatization would be weaker, particularly if privatization generates costs through the need for regulation to moderate market power. Finally, if firm performance improves with privatization and there is no change in incentives this raises the question of what then accounts for increased performance.

The relationship between ownership and incentives has largely escaped systematic examination in an older literature that compares the efficiency of state-owned and private firms² and in the more recent literature on privatization.³ Limiting the study of incentives is the lack of availability of information on executive compensation. Publicly traded firms in many countries, until recently, have not disclosed such information. For state-owned firms the problem has more been assembling the information from various sources, with no single repository of such information, and no commercial vendors seeing value in collecting and making comparable such information.

In this paper we use the United Kingdom as the stage to address the link between ownership and incentives. The large number of privatizations in the UK, the availability of high quality data (albeit requiring extensive effort to collect) on management incentives before and after privatization, and the time that has passed since privatization make it an ideal setting for such a study. We construct a comprehensive database for state-owned and privatized firms from 1970 through 1994. The data were collected from government sources, disclosures, and annual reports and includes extensive information for state-owned enterprises that we solicited directly from the firms. Our data include information on management compensation, options, and shareholding, with additional information on management and firm characteristics. Our data include 532 top managers from 112 firms, including 41 state-owned, 38 privatized and 33 publicly traded firms. These data allow us to provide an empirical answer to the central question of whether ownership influences managerial incentives.

While in many settings it is safe to assume that privatization will enhance incentives this was not the case in the United Kingdom as features of state ownership and privatization reduced the *ex ante* likelihood that privatization will have a significant effect. Rather than being controlled directly by a Minister (as is the case in many countries), UK state-owned firms were separate corporations with their own board of directors that included outside directors drawn from the private sector. Members of the board were not covered by unions and bureaucratic pay scales. This corporatized structure is one that could facilitate the use of incentives. At the same time, privatized firms had many features that might have led to lower use of incentives. Privatized firms were sold in a way to encourage disperse ownership which perhaps reduced incentives for active oversight of management. Governments also retained a golden share in most firms requiring state approval for takeovers. This restriction limited the ability to use takeovers to overcome the public good problem associated with monitoring management. In short, it could easily happen that privatization might limit the ‘grabbing hands’ of government, only to open up the same firm to more active ‘grabbing hands’ of management.

Our empirical strategy is straightforward. Managers' incentives to focus on financial performance come from two primary sources. First, they derive from the expected change in compensation associated with changes in financial performance (presumed to be affected by management effort) weighted by the probability that the executive remains employed. Second, they come from the effect of performance changes on the probability of being fired weighted by the expected loss in compensation from being fired. In this paper we provide estimates of the impact of the type of owner (state-owned, privatized, publicly traded) on the sensitivity of changes in compensation to changes in financial performance and on the level of management compensation. We combine these results with previous findings on the links between performance changes and the probability of management turnover (Cragg and Dyck, 1999) to estimate an overall incentive effect of ownership.

We find that while in theory government actors could have created managerial incentives, as a matter of fact they simply did not. To illustrate the lack of incentives tied to financial performance we simulate the effect of a one standard deviation improvement in financial performance and find a negligible change in management compensation of between -34 and -1,789 pounds. In addition, the compensation contract for managers in state-owned firms involved a salary and bonus that was 52 percent lower than that for otherwise similar managers in similar established publicly traded firms. When incentives through dismissal are combined with compensation related incentives, we estimate that a one standard deviation improvement in financial performance delivered a 2,400 pound decrease in compensation in state-owned firms prior to the announcement to privatize and a 6,800 pound increase after the announcement to privatize (while still state owned). Such incentives are too small to change behavior.

Privatized firms, in marked contrast, have economically and statistically significant relationships between management rewards and financial performance. Considering a one standard deviation increase in both accounting and market returns we estimate a change in compensation through salary, options and shareholding of 177,000 pounds for a manager in a privatized firm in the first four years of privatization and 345,000 pounds for a manager in a privatized firm with more than four years as a privatized company. Managers in privatized

firms receive levels of compensation that are statistically indistinguishable from those for managers in established publicly traded firms raising costs associated with dismissal. The incentives provided by these compensation structures appear large enough to influence management behavior.

Looking at the combined effect of incentives provided through compensation and dismissal reveals an interesting relationship in privatized firms. In the first four year as privatized firms, incentives provided through compensation dominate. While manager dismissals are high, the probability of dismissal is insignificantly (but positively) related to changes in financial performance. For more mature privatized firms, compensation and dismissal sensitivities are complementary with a 443,000 pound increase for a one standard deviation improvement in performance. Notably, in mature privatized firms the incentive intensity is higher than in established publicly traded firms.

Having established these facts, we then engage in more explorative research asking why state-owned firms keep low levels of pay and have no incentives and why managers in privatized firms have higher levels of incentives. To address these questions we revisit various theories of ownership and incentives, introduce additional documentary evidence, interviews with senior executives in state-owned and privatized firms in the UK, and quantitative data on oversight by analysts. This evidence suggests the importance of political constraints on pay setting in state-owned enterprises and the importance of a series of extra-corporate structures for modifying pay relationships once privatized. These results reinforce our earlier finding of the great difficulty of using pay for performance under state ownership. An additional implication of these findings is that without this array of public and private institutions in a fully functioning market economy, one cannot be sure that privatization by itself will produce positive results.

The paper proceeds in five sections. Section 2 provides institutional background. Section 3 introduces the empirical strategy and data. In section 4, we present our main analysis of compensation and incentives in state-owned, privatized and publicly traded firms. Section 5 explores additional evidence to aid in interpreting our empirical findings. Finally, we conclude.

2. Institutional Background

This section establishes facts that suggest why a comparison of compensation policies in state-owned and privatized firms will shed light on the abilities of these different ownership structures to address agency problems arising from the separation of ownership and control. First, we identify how the organization of management practices in state-owned firms did not preclude the use of incentives to align interests, and identify periods in which the environment was particularly ripe for the use of incentive regimes. Second, we describe the privatization program and the separation of ownership and control in privatized enterprises that suggest why the relationship between ownership and incentives cannot be deduced without empirical investigation.

State-owned enterprises have played a very important role in the post World War II British economy. On the eve of Margaret Thatcher's election as Prime Minister in 1979, nationalized industries accounted for almost one tenth of gross domestic product and one-seventh of investment. In comparison with state-owned enterprises in many countries, the UK firms had significant management autonomy. UK state-owned firms were corporatized meaning that top executives were not directly responsible to Ministers but rather were accountable to a board of directors composed of inside and outside directors. Managers were not bureaucrats and were not subject to bureaucratic pay scales. While compensation setting was a Ministerial responsibility that required the consent of the Prime Minister's office, there was every expectation when the system was introduced and throughout its duration that compensation policies could be used to enhance recruitment, retention and to provide incentives.

Three events offered the opportunity to change incentives tied to financial performance under state ownership. First, following a government White paper (HM Treasury, 1978) the government overhauled its evaluation system for state-owned enterprises, increasing emphasis on easily monitored objectives, including financial performance. The replacement of the Labor government with the Conservative government led by Margaret Thatcher in 1979 led to further reforms in the system for determining compensation for top executives in state-owned firms. Accordingly, we will examine the

incentive intensity for all state-owned firms before and after 1980.

Second, the announcement of the intention to privatize presumably clarifies objectives of the firm, focuses objectives more heavily on financial performance, and might remove political constraints on management behavior. In some agency models, these factors can lead, optimally, to the use of greater pay-for-performance sensitivity. We control for the time relative to privatization in some specifications.

Third, there were reforms in specific industries that made it easier to use pay as an incentive device. One of the most notable reforms was the Water Act 1983 which, spurred by a desire for boards to take a more commercial approach, reformed corporate governance in the water supply companies by replacing large boards of directors (~60 members) dominated by representatives appointed by local authorities with smaller boards appointed by ministers. We investigate incentive intensity before and after these reforms.

The privatization program has been comprehensive, introducing more than forty of the largest state-owned firms into the private sector between 1980 and 1991. Reviewing the main features of the UK government's approach to privatization, it is clear why many UK commentators had concerns that management would control firms with little oversight by shareholders, and consequently they doubted any change in managerial incentives with privatization would arise. The design of the privatization process intentionally blunted two of the mechanisms Shleifer and Vishny, 1997 identify at the heart of well functioning governance systems: concentrated ownership,⁴ and takeovers.⁵

Concentrated ownership directly addresses the potential conflict between managers and investors by aligning the cash flow and control rights of outside investors. Takeovers can also address governance concerns by overcoming the public good problem associated with monitoring management (Grossman and Hart, 1980). Without these mechanisms it is possible that privatized firms would initially be controlled by managers without oversight, and it was equally possible that managers might abuse their powerful position to reward themselves at the expense of shareholders.

With disperse ownership initially, and limitations on the use of takeovers, improved governance in privatized firms would depend more heavily on incentives introduced and adjusted by the board of directors. But the boards of directors, at least initially, were not appointed by shareholders but by the government with the advice of incumbent management. Moreover, the board relationship with management in established publicly traded firms in the UK was itself under attack at the time. Reflective of this dissatisfaction, the Cadbury Committee was established in May of 1991 to report on weaknesses in the financial aspects of corporate governance. The report (Cadbury, 1992) criticized UK board structures and relationships, with a view that directors were not sufficiently independent of management. Further dissatisfaction led to the Greenbury report, which criticized the pay systems used to align the interests of managers and investors.

3. Empirical Strategy and Data

3.1 – Empirical Strategy

We adopt a very simple empirical strategy to identify the incentive effect of compensation and how this differs across ownership structures. A managers' expected return from offering himself for employment, S , is the probability of turnover, F , multiplied by the wage if he becomes unemployed plus the probability of retaining his position multiplied by the expected wage if employed.

$$E(S) = \Pr(F) * W_{Unemployed} + (1 - \Pr(F)) * W_{Employed}$$

If we make the simplifying assumption that his wage as unemployed is equal to zero, the sensitivity of his expected compensation to a change in firm performance (arising through his effort) is seen to depend on the probability of dismissal, pay for performance sensitivity, and the level of pay.

$$(1) \quad \frac{\partial E(S)}{\partial P} = (1 - \Pr(F)) * \frac{\partial W_E}{\partial P} - W_{Employed} \frac{\partial \Pr(F)}{\partial P}$$

The first term in equation (1) is the incentive arising from a change in compensation given that the executive remains employed while the second term is the incentive coming from the effect of firm performance on the probability of being fired weighted by the loss in compensation over the expected duration of the job if the manager is fired.

We construct or use estimates for each ownership type (state-owned, privatized, established publicly traded) for each of the elements in equation (1). To estimate the level of compensation across our ownership types we regress the level of compensation for manager i in firm j at time t on an ownership dummy, manager characteristics (age, tenure, position in management hierarchy), industry and firm characteristics (size, regulated), time dummies, and in some specifications firm or manager fixed effects.

$$(2) \quad W_{ijt} = \alpha + \beta O_{jt} + \chi M_{it} + \delta I_{jt} + \phi_t T_t + \mu_j + \eta_i + \varepsilon_{ijt}$$

To estimate pay for performance sensitivities across our ownership types we regress the change in compensation ($\frac{\partial W_{ijt}}{\partial t}$) on an ownership dummy (O_{jt}) interacted with the change in performance ($\frac{\partial P_{jt}}{\partial t}$), ownership dummies and time dummies (T_t). By looking at changes rather than levels there is no longer a compelling reason to include firm and manager characteristics. In essence, we are taking the first difference of equation (2) and adding performance as an explanatory variable.

$$(3) \quad \frac{\partial W_{ijt}}{\partial t} = \alpha + \beta O_{jt} * \frac{\partial P_{jt}}{\partial t} + \gamma O_{jt} + \phi_t T_t + u_{ijt}$$

In previous work (Cragg and Dyck, 1999), we related the probability of being fired to firm performance and use the estimates from that study again here.

$$(4) \quad \Pr(F) = \alpha + \beta O_{jt} * \frac{\partial P_{jt}}{\partial t} + \gamma O_{jt} + \phi_t T_t + v_{ijt}$$

3.2 Data

The following section describes briefly the sample used in our analysis with variables defined as they are used in the empirical section. Summary statistics are presented

in Table 1. All monetary variables have been revalued to 1990 pounds using the CPI deflator. Refer to the data appendix for further information on data collection, firms and definitions.

Place Table 1 here

The sample

To construct our sample we identified all medium to large state-owned firms that provided commercial goods or services in 1975, focusing on firms organized as public corporations. From this target group we excluded any firms that became a disparate collection of small firms at the time of privatization and included any new state-owned firms created after 1975. Through contacts with firms and use of archived annual reports through the libraries of Harvard University we assembled data for 41 state-owned firms and 38 of the 42 targeted privatized firms, including almost all of the 48 major privatized firms identified by the Department of the Treasury in 1995.⁶ Where possible we assembled complete data on management and firm performance from 1970 through 1994.

We also assembled comparable data for a set of firms that remained publicly traded throughout the time period. For 32 state-owned firms in 1975 we assembled a list of all publicly traded firms with the same Financial Times classification code available from Datastream. We reduced this list by requiring all firms to have assets at least as great as the second-largest government-owned firm in the overall sample. We picked randomly from the remaining firms and retained the firm if copies of annual reports were available in the archives of Harvard University's Baker library. If reports were not available, we randomly drew another firm. For state-owned firms without comparisons we used the sample of firms in Datastream with the Financial Times equivalent of the same 1 digit SIC code and chose firms with sales levels within 20% of the target firm.

Managers

We identified “top management,” as all individuals with the titles Executive Chairman, Executive Deputy Chairman, Chief Executive Officer or Managing Director, and defined “top executives” as Chairman unless the Chairman is clearly not an active member of the firm in which case we use the Chief Executive Officer. On average there were 2 top managers per firm per year and 1.3 top executives per firm year.⁷ In total, we assembled 2,921 observations with information from 532 managers. For each manager we collected information on a manager’s age and tenure. Theory has suggested that both of these factors are likely to increase compensation through their affect on human capital acquisition, learning by the board of directors and career concerns.

Compensation

We identified the annual salary and bonus for each of the top managers in our sample using company annual reports. Remuneration is defined to include the manager’s annual salary, bonus (if any), and the cash value of perquisites. Using these same reports we construct a complete record of management shareholding and option holding and use the Black-Scholes formula to value these options (see Data Appendix).⁸

Political intervention and management ability

In industries where political actors retain decision-making rights over pricing, whom to serve, use of inputs, etc., there is potentially a more limited scope for management impact and management ability. We account for this possibility in two ways. In some specifications we include a “regulated firm” dummy that indicates if the firm is subject to price regulation following privatization.⁹ In other specifications we include dummy variables to identify four ‘talent tiers’ as defined by those who oversaw state-owned enterprises. The state commissioned a number of job evaluation studies to compare the “relative weight of their responsibilities (Chairmen and members of the nationalized industry Boards) with those of equivalent appointments in industrial, commercial and financial organizations in the private sector, and to make a critical evaluation of their salary structure.”¹⁰ The Top Salaries Review Body made recommendations for salary tiers by firm and position based on these studies and

on other political factors, including a possible desire to legitimize their own actions. We use the talent tiers as defined in their 1980 review.¹¹

4. Empirical Findings

4.1 Compensation Levels

Place Table 2 here

Table 2 reports our estimates of differences in the level of compensation across ownership types by running four different specifications. We find that there are significantly lower levels of compensation in state-owned than privatized or publicly traded firms. Each of these specifications include firm size, industry characteristics, manager characteristics (age, tenure, ceo dummy), and year fixed effects as explanatory variables.

In the specification used for column 1 we estimate that managers in state-owned firms earn 44 percent less than managers in publicly traded firms and managers in privatized firms earn an insignificant 3 percent more than their counterparts in publicly traded firms.¹² Including the Black-Scholes value of new option grants, as we do in column 5, increases the salary gap relative to publicly traded firms to 52 percent and there is an insignificantly higher level of wages in privatized firms of 7 percent. Similar results hold when we control for other possible drivers of differences in salary levels as we do in columns 2-4 and 6-8. Column 2 (6) divides state-owned and privatized firms into “talent tiers” allowing for the talent tiers to have different effects before and after privatization. Column 3 (7) includes firm fixed effects and column 4 (8) manager fixed effects.

Control variables have expected signs and magnitudes. As in other studies, firm size has a significant impact, with an elasticity of 0.27-0.28. As expected, tenure and increases compensation, while being the top executive provides a premium of 18 percent. The negative coefficient on the age at which a manager becomes a top manager suggests that younger managers are rewarded more handsomely. Being a manager in a “regulated” firm

produces a discount of 19 –20 percent relative to non-regulated firms in the same ownership category. Under state ownership, the compensation gap (salary gap) is greatest for firms in the lowest talent tier at 63 percent (56 percent), and least for managers in firms with the highest talent tier where the gap is 48 percent (40 percent).

Place Figures 1 and 2 here

Figure 1 and 2 summarize the differences across ownership types. Figure 1 plots the percentage difference in the level of salary and bonus relative to salary and bonus in publicly traded firms in the same time period and shows that the negative impact of state ownership on compensation levels appears to grow over time.¹³ In Figure 2 we plot the percentage difference in the level of salary and bonus relative to salary and bonus in publicly traded firms around the privatization event.¹⁴ Including option grants both increases the salary gap for managers in state-owned firms and leads to a more rapid turnaround in salary after privatization.

Place Table 3 here

Table 3 completes our description of differences in compensation levels. As panel A shows, managers in privatized firms receive an option grant in the privatization year with a mean value of 166,000 pounds. This amount roughly equals their salary and bonus the year after privatization. New option grants are disproportionately allocated in the privatization year and the subsequent two years. The value of shareholding is significantly less than the value of option holding, particularly for the median manager. Panel B shows that managers in publicly traded firms in almost all time periods receive higher option grants, have greater stocks of preexisting options and in particular have higher level of shareholding.

4.2 Incentives

Incentive intensity in state-owned enterprises

Place Table 4 here

Table 4 presents estimates for the incentive intensity in state-owned enterprises. Regardless of specification, there is no link between compensation and financial performance in state-owned enterprises. While contracts could have been used to encourage managers to focus on financial performance as a matter of fact they were not used this way.

Our principal accounting measure of firm performance is the change in the annual return on net operating assets (ROA) adjusted for inflation.¹⁵ Financial returns have been much poorer for firms under state ownership than for privatized and publicly traded firms. The after-tax return over the whole sample period for state-owned firms is just 3.5 percent. For some regressions we allow for owners to use relative performance comparisons in setting incentives. We identify returns for all other firms in the same industry code in the United Kingdom excluding the target firm. The average industry return is value weighted. We then decompose firm returns into those associated with overall industry trends (what could be called “luck”) and those that can not be accounted for by industry trends (what could be called “skill” or “effort”) by regressing firm returns on industry returns, using the predicted values from this regression as our measure of performance related to industry effects and the residuals from this regression as our firm specific returns.

Table 4 presents 7 different specifications. In the first five specifications the dependent variable is the *change* in the natural logarithm of salary and bonus. For the last two specifications, we follow managers through the privatization process and include all sources of firm compensation – we add to salary and bonus the value of new option grants, the change in the value of preexisting options and the change in the value of shareholding. Specifically we examine the *change* in the natural logarithm of the wealth tied to the firm.¹⁶

In looking at changes in manager compensation there is no longer a compelling case to include management and firm characteristics in these regressions.¹⁷ We continue to include year fixed effects to take into account possible non-linear time trends in the changes in salary and bonus. We restrict our attention to top executives to try to reduce incentives provided by career concerns.

The base specification in column 1 shows an insignificant (and negative) estimate of the elasticity of compensation to changes in financial performance. To illustrate the limited incentives we simulate the impact of a one standard deviation improvement in firm performance (7.7 percent) and find that this lowers compensation in the base case by a negligible 250 pounds. Specification 2 decomposes accounting returns into industry and abnormal returns finding a lack of sensitivity to either. Specifications 3-5 focus on the three events mentioned in section II that had the potential to change incentives tied to financial performance under state ownership. There is no difference in pay for performance after the election of the conservative Thatcher government. The effect of announcement to privatize is to lower the sensitivity of compensation to performance. Only for one specification, the reforms of the water sector presented in column 5, is the measured incentive intensity after reforms positive and increased relative to the pre-reform period but even here it is statistically indistinguishable from zero.

Specifications 6-7 reinforce these findings that it is state ownership rather than firm, industry or manager characteristics that account for the lack of a link between pay and performance. In columns 6-7, we include privatized firms, focus on the change in management wealth tied to the firm (which produces no change for managers in state owned firms as they lacked both shares and options). In specification 7, we include manager fixed effects. As expected, the sensitivity of compensation to changes in performance in state-owned firms is indistinguishable from zero. For privatized firms in general (specification 6) and the very same manager in particular (specification 7) there is a significant relationship between changes in compensation and changes in firm performance, a point developed in more detail in the next table.

These results are subject to a potential sample selection bias arising from the fact that

we lack information on compensation of managers who have resigned from the firm, either voluntarily or as a result of being fired. To account for this potential bias we used the heckman procedure to simultaneously estimate the relationship between managerial wealth and firm performance and a selection equation that includes variables that account for the likelihood of observation. Following Cragg and Dyck (1999) we use age, tenure and firm performance variables in the selection equation. Our results are unaffected, with similar coefficient estimates and levels of significance.¹⁸

Incentive intensity in privatized enterprises

Place Table 5 here

Table 5 completes our investigation of pay for performance sensitivities by estimating the incentive intensity in privatized and publicly traded firms where we include market returns in addition to accounting returns. Panel A includes in the change in total compensation any changes in wealth arising from changes in the value of shareholding, existing options and new option grants. Panel B presents results examining incentives provided by salary and bonus. We restrict ourselves to the 1980-1994 time period where options were used more regularly. We estimate using robust regressions to dampen the effect of some large outliers for publicly traded firms.

Our market measure of firm performance is the change in shareholder wealth measured by the realized return on common stock adjusted for inflation. In the 1980s, rates of return average 19 percent in privatized firms and 17 percent in publicly traded firms. Compensation packages are often complex including objectives related to financial and stock market measures. Studies such as Jensen and Murphy, 1990 and Hall and Liebman, 1998 have focused on shareholder value, a forward-looking measure that can capture the long-run implications of current managerial actions. However, stock market returns have highly idiosyncratic variation, are much more volatile than accounting returns, and don't exist for

state-owned firms. Accounting performance, in contrast, has lower volatility, may be more easily controlled by management, and is used as targets in compensation contracts. In all specifications we simultaneously include accounting and market returns to account for the complexity of compensation packages.

The basic story of significant incentives tied to financial performance in privatized firms is told in column 1. The rest of the table explores whether this overall effect masks differences in sensitivity of compensation to industry effects and abnormal returns (column 2), whether privatized firms in their first four years are different than after four years (column 3) are regulated or not (column 4) or whether the differences are influenced by the continued existence of a government stake which we define as a stake of 20 percent or greater (column 5).

Using the elasticities in specification 3, we estimate that a one standard deviation improvement in firm performance will produce a 39 percent improvement in wealth tied to the firm immediately after privatization and a 32 percent increase in wealth tied to the firm after more than four years in the private sector. Because of options and shareholding, the wealth tied to the firm is considerable. To get a sense of the importance of these incentives we simulate a one standard deviation improvement in performance and find that this delivers a 177,000 to a 345,000 pound increase in wealth, depending on whether we are looking at managers in firms that just privatized or at mature privatized firms.

Regardless of specification, there is a significant relationship of compensation to market returns with elasticities ranging between 0.5 and 0.65 depending on the specification. There is a generally positive but less robust relationship between compensation and changes in accounting returns with all estimated elasticities except one ranging from 0.84 to 1.78. Notably, when we decompose accounting returns into abnormal and industry returns, compensation is only statistically linked to industry returns.

These results also allow us to see if there are significant differences across privatized firms in how incentives are introduced. Overall, there are no significant differences. Most of the incentive intensity comes through sensitivity of management rewards to stock market

returns, and all privatized firms used options extensively. Looking at sensitivity to accounting returns, though, we do see some differences across types of privatized firms. After the first four years as a privatized firm there no longer is a significant link between changes in wealth and changes in accounting returns. Regulated firms are more likely to link changes in wealth to accounting returns. Perhaps this is driven by a belief that firms will have to defend their salary increases to regulators. Interestingly, in firms with continued significant government stakes they are less likely to link compensation to accounting returns than firms with no government stake.

Similar results are found in panel B where we focus on the change in salary and bonus as the dependent variable. Market returns remain significant in many specifications, although here they are significantly less with an average elasticity of 0.102.¹⁹ Elasticities to accounting returns are higher in most specifications than looking at log differences in wealth with the same patterns.

Our findings for established publicly traded firms in the United Kingdom are similar to findings for privatized firms. In publicly traded firms changes in compensation are driven by market returns with elasticities ranging from 0.49 to 0.53.²⁰ Accounting returns for the most part have an elasticity around 1.0. The implied percentage change in wealth for a one standard deviation improvement in firm performance is 29 percent, producing a value effect of 239,000 pounds. These sensitivities are slightly less than in privatized firms.

Again, these results are subject to a potential sample selection bias as we lack information on compensation of managers who have resigned from the firm. We use the heckman procedure to simultaneously estimate the relationship between managerial wealth and firm performance and a selection equation that, following Cragg and Dyck (1999), includes age, tenure and firm performance variables. Our results are unaffected, with similar coefficient estimates and levels of significance.²¹

Joint incentives from compensation and dismissal

Place Table 6 here

In table 6 we summarize these findings for incentives in state-owned, privatized and publicly traded firms. The first three columns show how a one standard deviation change in performance affects the percentage change in salary and bonus (column 1), the percentage change in management wealth tied to the firm (column 2) and the impact in terms of pounds for a typical manager of that ownership type (column 3). The next two columns reproduce results from Cragg and Dyck (1999) on the probability of management dismissal by ownership type and the change in that probability with an identical one standard deviation change in financial performance. Column 6 provides the summary measure of incentive intensity suggested by equation (1). The incentive intensity measured here is the combination of the incentive arising from the impact of performance changes on compensation and on the probability of being fired. It allows us to see how dismissal and compensation sensitivities interact.

We estimate that a one standard deviation improvement in financial performance will deliver a 2,400 pound decrease in compensation in state-owned firms prior to the announcement to privatize and a 6,800 pound increase after the announcement to privatize (exclusively through the impact of performance on management turnover). These values are negligible, particularly in comparison to privatized and publicly traded firms. In privatized firms in their first four years we estimate an 84,000 pound change in management wealth for a one standard deviation improvement in firm performance in the first four years (equivalent to 46 percent of median compensation) and a 443,000 pound change in management wealth after four years (equivalent to 176 percent of median compensation). Accounting for these differences is the fact that in the early years of privatization dismissals are positively related to firm performance, thus working to reduce the overall incentive effects of performance

improvements. In more mature privatized companies, compensation and dismissal sensitivities work in the same direction accentuating the incentive effect of ownership. The results after the first four years are even higher than in established publicly traded firms where we estimate that a one standard deviation improvement in firm performance translates into a 283,000 pound change in management wealth (equivalent to 144 percent of median compensation).

5. Accounting for Differences in the Use of Incentives

Our empirical evidence establishes the significant relationship between ownership and incentives that has previously been based on anecdotal evidence and was an open question in the United Kingdom. What we have yet to address is how to interpret this evidence. Why are there no incentives tied to financial performance under state ownership and such low pay levels? Why does privatization lead to increases in incentives and compensation levels? To address such questions of interpretation and to shed further light on our empirical findings we examined the documentary record, conducted interviews with 26 senior executives from 13 state-owned and privatized firms in the UK,²² senior representatives from two regulatory agencies, a representative from the Treasury, and analysts of privatized industries in three major investment houses, and gathered further quantitative data. This approach complements our empirical approach, although it does not allow for the same types of tests as in section 3 and 4.

5.1 The documentary record and the lack of incentives under state ownership

Why are there no incentives under state ownership? Our findings could be explained as the result of politicians using the firm to address their own political objectives. Politicians might be interested, as in Boycko, Shleifer and Vishny (1996), in directing managers to deliver returns to their constituents through enhanced employment and wages in state-owned enterprises or to fulfilling other political objectives. Alternatively, lower levels of pay incentive intensity could be optimal if managerial ability is not as important in state-owned as private firms (e.g. due to ministerial involvement in decision making) and if state owners

reduce incentives tied to financial performance out of a desire to direct managers to pursue other social welfare objectives.

The documentary record provides considerably more evidence that the lack of incentives was a costly decision driven by political factors than some optimal choice, although the political factors we identify have little to do with transferring resources to supporters. Pay levels were initially set lower in SOEs than in private firms. The desire to signal in a public way government's desire to fight inflation produced statutory restrictions on pay setting that "were designed to operate more severely at higher income levels"²³ and severely limited pay increases. "Concerns about inflation has always made it unrealistic to suppose that decisions about top salaries could be taken right outside the matrix of politics."²⁴ "Between 1972 and 1978 the salaries of Chairmen increased by around 4 percent compared for example with an increase of over 125 percent in the Retail Price Index over the same period." (1980: 9)

While inflationary concerns eased in the 1980s, these established low levels of pay were a continued obstacle to the use of performance related pay, with concerns focusing more on increasing the levels and the government had little appetite to push pay for performance. BAA officials reported to us that their concerted effort to provide a maximum bonus of 15 percent, negotiated in 1981, required significant struggle and ultimately demanded the approval of the Prime Minister's office. Other executives reported to us that reforms following the removal of oversight by the Review Body of Top Salaries led to some pay for performance but that the maximum bonus in their industries almost never exceeded 5-7.5 percent of base salary due to political concerns.²⁵

What about the possibility that the lack of incentives reflected an optimal strategy given differences in the demands made of managers in state-owned enterprises (different marginal productivity) and the desire of the government to encourage managers to focus on non-financial objectives (different objectives)? The differences in incentive intensity are consistent with reduced management productivity under state ownership, lower management

discretion, greater idiosyncratic variation in performance measures, and/or greater costs to management effort.

As one (weak) test of the impact of productivity on compensation systems, we take advantage of the fact that the Top Salaries Review Body classified management jobs in firms into different talent tiers and examine whether there are differences across these talent tiers in terms of compensation and incentives. This is a weak test for this classification could easily reflect political factors in addition to a real evaluation of the demands of different jobs. Contrary to the contention that compensation setting was optimal, we found that for even in the highest talent tiers there was no link between changes in compensation and changes in firm performance. These findings are based on regressions similar to those in Table 4, where we divided state owned enterprises into different talent tiers and examined pay for performance sensitivity in each tier separately. Also contrary to the contention that salaries were optimal and based on differences in productivity and ability, the Top Salaries Review Body, the bureaucratic body responsible for oversight, claimed in a 1980 report that there was no real difference in the management ability required across state and private ownership: *“The job of a Chairmen or Board member of a nationalized industry is not the same as the job of an opposite number in a private sector organisation. Some of the constraints and the pressures are different. They are not, however, any less and we are satisfied that the jobs are in general of comparable difficulty and weight.”* (1980: 10)

It is also theoretically possible that managers faced monetary incentives, but that these incentives were targeted towards other objectives. There is no evidence in the documentary record to support such a claim. Such an assertion is difficult to address empirically, as there is no consensus on the alternative objectives that state-owned managers might have been directed to achieve. But one source of empirical evidence that relates to this contention is the absolute and relative variability of compensation in state-owned enterprises. The evidence shows little absolute and relative variability in compensation, making it hard to argue that monetary compensation was used as an incentive device tied to other objectives. As shown in Panel B of Table 1, in the 1980-1994 time period, when there were both privatized and state-owned enterprises, the standard deviation for the change in total

compensation averaged just £ 35,000 across our whole sample of state-owned enterprises, compared with £ 286,000 for privatized enterprises. The coefficient of variation similarly shows significant differences in variability with a coefficient of variation in state-owned enterprises of just 0.52, compared with double the coefficient of variation in privatized firms of 1.08.

Most difficult to explain under a hypothesis of optimal wage setting is that the lower compensation levels in state-owned enterprises were constantly criticized by those tasked with evaluating their impact. These low compensation levels were described as increasing the difficulty of “attracting and retaining individuals with capacity and experience to manage some of the major industries on which the future prosperity of the country depends, in a rapidly changing and increasingly international market.” (1980: 3) The low levels also limited the ability to use compensation as a tool to align interests. With fixed upper limits on pay levels bonuses could not be offered and with pay barely sufficient to meet managers’ opportunity cost the government could not use reductions in pay as a device without leading to exit.

5.2. Interview evidence and the increase in compensation levels and incentives with privatization

Why did privatized firms increase pay levels and introduce incentives tied to financial performance? What came through clearly in our interviews was the influence of a series of extra corporate structures that forced changes in management compensation and dismissal practices. Important factors included active scrutiny by the press and reports of private groups (e.g. the Cadbury and Greenbury Commissions) that produced guidelines for corporate governance practices that were subsequently incorporated in stock exchange listing rules.

The most critical institutional actors behind the rapid introduction of incentives to align the interests of managers and shareholders reported to us though were institutional

investors, influenced heavily by the advice and analysis of security analysts employed by the major brokerage houses in the United Kingdom. For the electric distribution and water supply companies alone, it was reported to us that there were 30-40 full time analysts, with most of them employed in 8 major merchant banks, but also analysts from 10 smaller merchant banks. As an illustration of the extent and speed of oversight by institutional actors, Table 7 shows the rapid introduction of analyst coverage of privatized firms in the UK, as well as the ability of these analysts to accurately monitor the performance of management. In privatized firms, the average number of analysts issuing earning forecasts is 10.0 in the privatization year, rising to 15.7 by year four. This compares with a mean level for established publicly traded firms in our sample of 14.0. The deep financial markets in the UK allowed these analyst groups to be in place quickly.

Place Table 7 here

The analysts' oversight of firm management reported to directors and communicated widely in the business press, as we reported in Cragg and Dyck (1999), contributed to significant management turnover in enterprises bringing in new management at the top level in many firms, and at the second level in all firms.²⁶ As one manager described the relationship that evolved, "*The investors are clear about what they want. You should not underestimate the power of analysts. ... More importantly they hold you to account. You have to hit the number. Analysts are always monitoring you.*" A particularly pressing area that needed to be filled was a new finance director for the old ones lacked the necessary experience to communicate effectively with the investors and the City of London. These new imports were drawn from the private sector and commanded higher salaries. It was often the case that the new hire had a higher salary than the incumbent CEO, and that to maintain an internal wage hierarchy the CEO had to raise his salary as well. The new option packages were also supported by many institutional investors and seen as a way to align interests given the lack of shareholding by managers at the time of privatization.

Of course this story of management change and incentive reforms as a result of market pressures could be nothing but a cover story. What about other explanations for changes in salary levels and incentives? One competing explanation is that the increased salaries are evidence of self-dealing and that the option packages weren't designed as incentive devices but rather another way to deliver extra compensation to managers. Our evidence of almost identical increases in salary levels with manager fixed effects (specification 8 of Table 2) is consistent with this story. As this story goes, if managers were willing to work for lower salaries before, and the job doesn't increase in risk or difficulty, then the only possible accounting for this fact is manager self-dealing. Wolfram (1998) comes to this conclusion in her examination for the electricity supply industry.

This argument may very well be true. But our interviews and evidence suggest that it would be a mistake to overstate this claim. Our findings in Cragg and Dyck (1999) of significant management change at the top and second levels and the belief in a wage hierarchy (however irrational this might be) suggest an alternative explanation for salary increases driven by a change in management ability. In addition, as we reported above, incentives increased significantly for the very same managers (Table 4, specification 7). Managers felt these incentives. As one executive remarked to us, *“Financial rewards change culture faster than anything – if they are big enough. Financial rewards make you do what they (the shareholders) want you to do. Previously individuals had been paid to come to work.”* Following this statement he turned to a TV set he had on in his office that listed stock market prices. *“there is something you wouldn't have seen 10 years ago.”*

6. Conclusion

This paper contributes to the long-standing debate about the links between ownership and incentives. While the debate has revolved largely around theoretical discussions or references to anecdotes we provide systematic empirical evidence.

We find that while in theory government actors could have created managerial incentives, as a matter of fact they simply did not. In the state sector, management contracts involved salaries that were low in comparison to similar managers in similar publicly traded

firms (52 percent less) and they provided no incentives. A one standard deviation improvement in financial performance produces a negligible change in management compensation of between –34 and –1,789 pounds in state owned firms.

We investigate other possible explanations for our findings of no incentives under state ownership – including the possibility that compensation packages were optimal and that additional incentives in state-owned enterprises were tied to non-financial objectives – and find little evidence to support such claims. Rather, we document the existence of serious political constraints that limited the use of compensation as a tool to align interests under state ownership.

This finding of no incentives in state-owned firms provides a cautionary tale for ongoing proposals to significantly enhance incentives in state-owned firms. It is hard to imagine a setting as well positioned as the United Kingdom to provide such incentives, with corporatized firms, able bureaucrats, and in the 1980s at least a government that was devoted to markets and market forces. The inability to provide incentives in UK state-owned firms suggests similar problems might develop following reforms focused on incentives in the state sector in other countries.

We find that in contrast privatized firms in the UK made extensive use of incentives to align the interests of owners and managers. For a one standard deviation improvement in firm performance we estimate an increase in management wealth of 177,000 pounds in a newly privatized firms and 345,000 pounds in a mature privatized firm. Compensation and dismissal incentives can work together to significantly increase incentives, as we find a change in returns for a manager in a mature privatized firm of 443,000 pounds for a one standard deviation improvement in firm performance, or can work at cross purposes, with the compensation sensitivity making up for weak initial incentives of dismissal linked to financial performance in privatized firms with the net effect of 84,000 pounds for a typical manager in a young privatized firm.

We document the instrumental role of a series of extra-corporate structures in compensation setting in privatized firms. Reports of private groups (e.g. the Cadbury and

Greenbury Commissions) produced guidelines for corporate governance practices that were subsequently incorporated in stock exchange listing rules. Equity analysts examined management ability and firm relative performance and directors read their reports. The press and investors pushed directors to take action in firms that were performing relatively poorly. These institutional pressures were quickly applied to privatized firms and worked to increase managerial responses and to improve financial performance.

These findings support the focus on management incentives in theoretical approaches to state and private ownership. To use Vickers and Yarrow (1988) term, incentives are certainly “keener” after privatization, providing some support for the use of this approach. Our findings of significant increases in incentives with privatization and that incentives exceed those in established publicly traded firms contrasts with popular press reports that focus just on the increased level of compensation for specific managers.

Do these results have wider implications for other countries interested in privatization? We are less confident in projecting these results to other countries than our findings on a lack of incentives under state ownership. As we have noted, central to the reforms in privatized enterprises were the dense web of extra-corporate structures that helped to encourage incentives for managers in privatized firms. For privatization in countries outside the UK to create similar incentives when shareholding is disperse, similar institutional features appear to be necessary. As but one illustration of the differences involved, consider the evidence on the extent of coverage by equity analysts, as a proxy for the extent of institutional structures, provided in Panel B of table 7. The UK is exceptional in the speed of coverage, having more analysts, and lower forecast error and dispersion. Other countries with high levels of legal protections for investors also have the ability to leverage institutional actors like analysts, but such actors do not exist in many settings, particularly where legal protections are weak. Thus another implication of these findings is that without this array of public and private institutions in a fully functioning market economy, one cannot be sure that privatization by itself will produce such positive results.

Data Appendix

Data Sources

We located annual reports for state-owned firms by contacting the Public or Corporate Relations Officer of the largest remaining private entity that once was a nationalized industry and asked for copies of their annual reports up to privatization. For management information for publicly traded firms we consulted archived annual reports (1970-1980) and copies of annual reports from microfiche and CD-ROM (1981-1995). We used the *Datastream* electronic database for performance information for the publicly traded firms in our sample and for the performance of other firms in the same industry classification. We excluded the actual year of privatization (final year of state-ownership) from our regression results because of accounting changes coinciding with privatization and the difficulty of accurately identifying who made board decisions during this year.

Accounting Issues

The accounting convention used for reported earnings is historical cost accounting.²⁷ Most firms used either a March 31 or a December 31 fiscal year end. For descriptive purposes we define the data from a company with a March 31 fiscal year end as the data for the previous fiscal year (e.g. data from an annual report dated March 31, 1984 is classified as data from 1983).

Performance Measures

We define earnings as the reported operating income after depreciation, interest and taxes for the reporting fiscal year. We use net operating assets as our measure of assets. The operating assets in a given year are defined as total assets less short-term liabilities. The net operating assets we use for constructing ROA is defined as the average of net operating assets from the previous fiscal year end and the current fiscal year end. This averaging correctly measures the asset base used to generate the cash flow over the reporting year. Net operating assets was used instead of total assets because many firms did not separately report current assets and liabilities, just providing one net current liabilities figure.

Top Management

Our definition of “top management” includes all individuals with the titles Executive Chairman, Executive Deputy Chairman, Chief Executive Officer or Managing Director. We identify the Chairman as an inactive member if his compensation was significantly below that of the highest paid director and secondary sources confirmed his non-executive status. We identified a manager as remaining with the firm in a particular year if he occupied the position for six months or greater in that reporting year. We identify a manager as having resigned in a particular reporting year if he occupied that position less than six months in the reporting year.

Management Compensation

We identified management shareholding from company annual reports. The Company Act of 1967 requires the firm to list all shareholdings held by the manager, family members, and trusts where a family member is a trustee. To calculate the capital gains associated with shareholding in a given year, we assume that the manager receives the full market return from that year on the shares identified in the previous year’s annual report.

Options

We collected options data for all top managers from 1970-1994 from the notes to the audited annual reports. Our measure of total options include Department of Inland Revenue approved share option schemes (RESOS), employee savings related share option schemes (SAYE), and senior employee share option schemes (SESOS). Consistent with other studies (e.g. Hall and Liebman, 1998, Main, Bruce and Buck, 1996), we value executive option holding using the Black Scholes pricing formula for a European call option adjusted for dividends (Merton, 1973).

As a measure of the risk free rate we use the median value for the 3 month UK Treasury bill rate. We estimate the expected dividend yield as the company's median dividend yield over the previous fiscal year. Our estimate of expected stock price volatility is equal to the standard deviation of the company's adjusted stock price over the previous year.²⁸ As our measure of the stock price we use the price on the last day of the fiscal year. To impute an exercise period, we follow tax guidelines and assume that the exercise period is ten years. In the UK executives are given deferred tax liability and a lower tax rate if options expire more than three years and not less than ten years from being issued.²⁹ To impute a strike price we assume that all options are issued at-the-money, where we use the end of year stock market price (Hall and Liebman report that in the US the vast majority of options have such characteristics.) Use of this assumption likely understates the value of options as, at least since 1991, UK executives are allowed to be issued options at a strike price up to 15 percent below the market price. To impute an exercise price we use the median price in the year in which we record an exercise of the options.

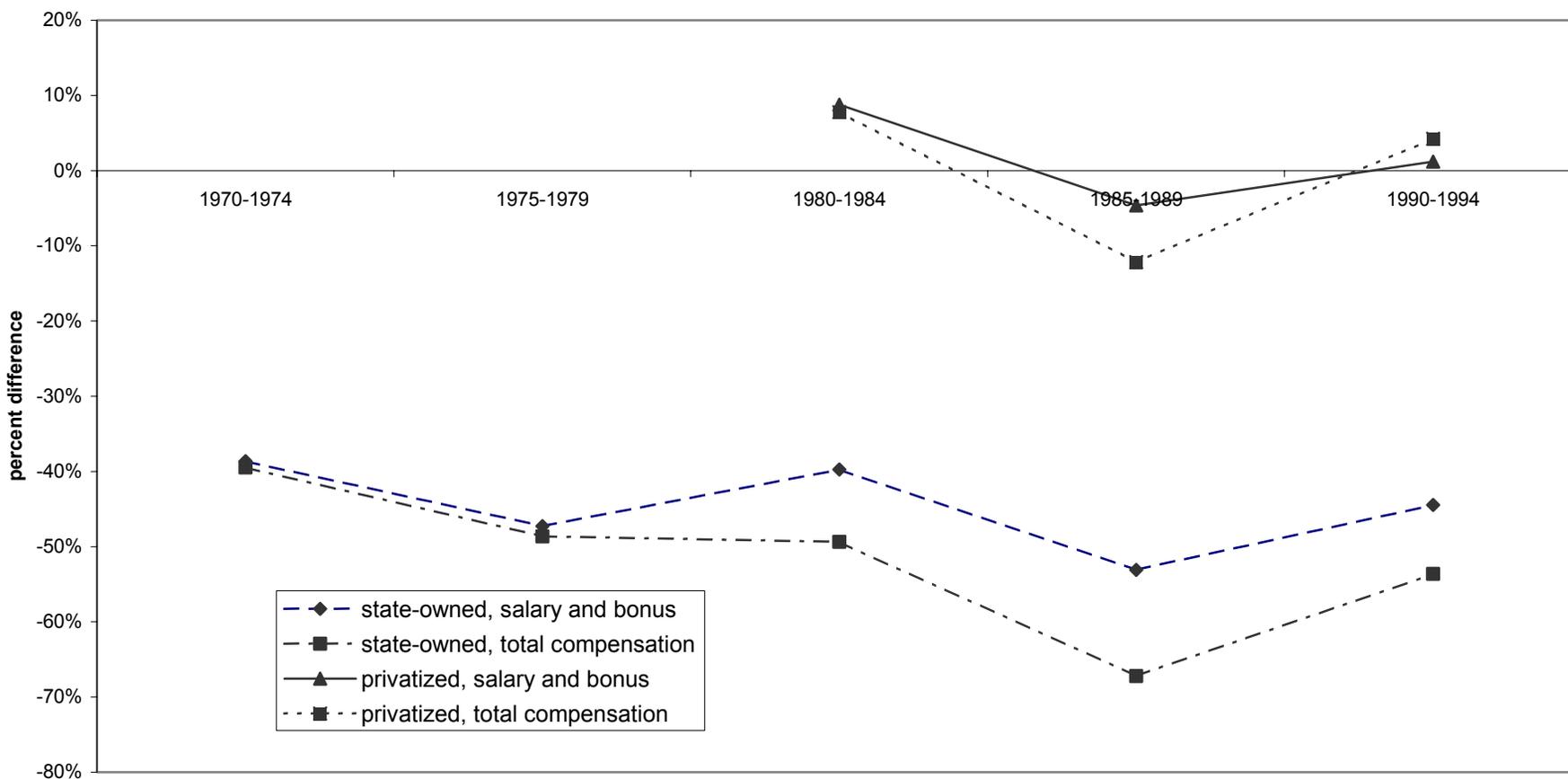
Stock splits

We identified stock splits by comparing the daily series of raw and adjusted prices, identifying a split when the daily difference exceeded 30 percent. In companies that exhibit stock splits, we assume all new option grants are offered at the end of fiscal year price, that is the price prevailing after the stock split.

Privatization

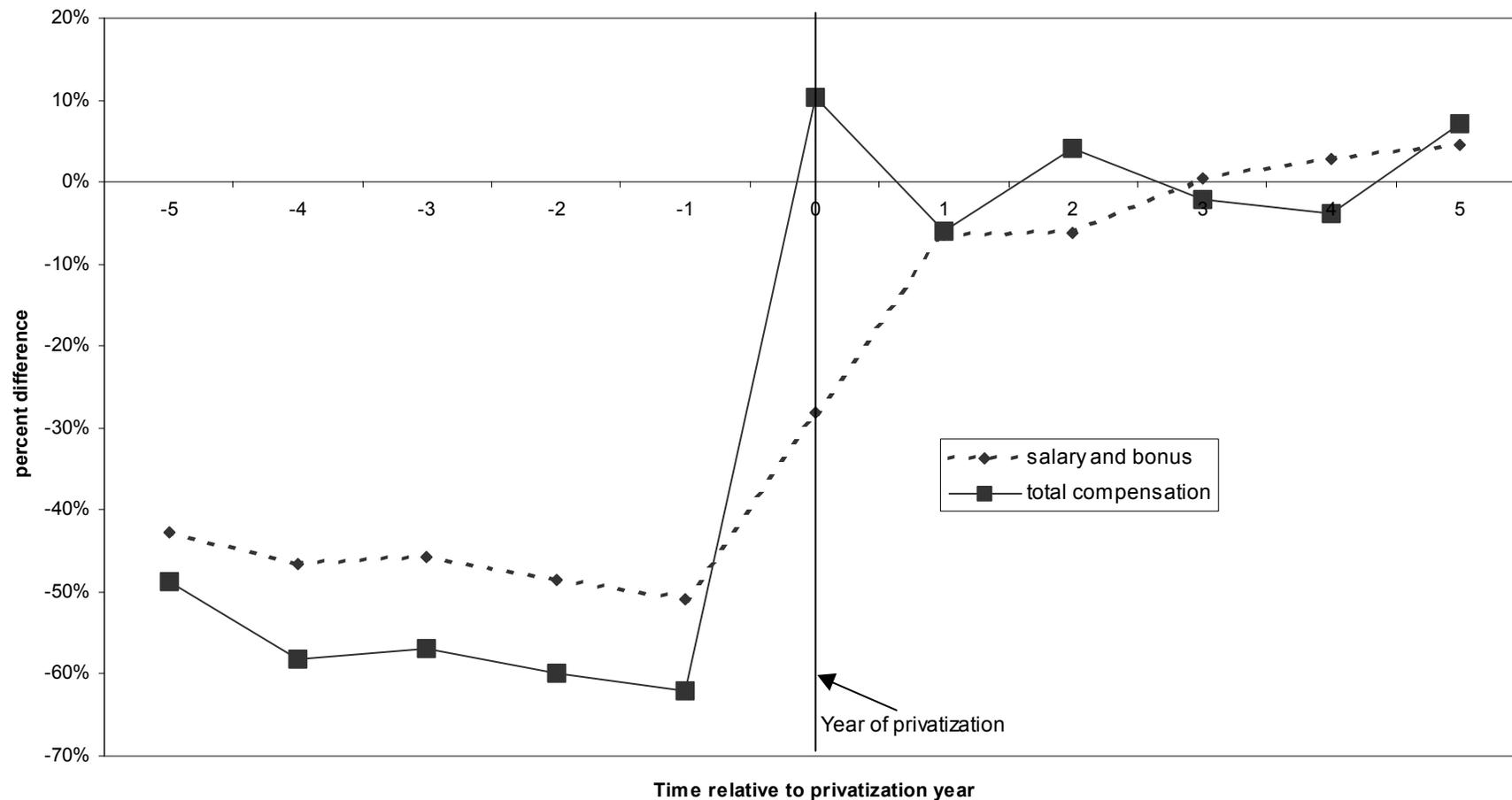
The fact that a large number of the publicly traded companies are privatized in the sample period presents a challenge. We cannot base the price of options in the first year on historical stock and dividend data for the company as such data does not exist. For this year, we calculated the annual stock volatility and expected dividend yield for all of the companies that share the same Financial Times Actuarial Industry classification and used the median values as our proxy. Starting in the second year, we use a company's own historical volatility and dividend yield.

Figure 1 - Compensation relative to established publicly-traded firms (1970-1994)



Note: Reported results are the difference between coefficient estimates for ownership type and established publicly-traded firms in each time period from a regression that includes controls for age, tenure, sales, ceo, electric, and water.

Figure 2 - Compensation around privatization relative to levels in established publicly-traded firms



Note: Reported results are the difference between coefficient estimates for ownership type and established publicly-traded firms in each time period from a regression that includes year dummies, and controls for age, tenure, sales, ceo, electric, and water.

Table 1. Summary Statistics, 1970-1994

A. 1970-1994								
	All		State-owned		Privatized		Publicly-traded	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Age when first top manager	52.4	(6.8)	53.5	(5.6)	52.6	(5.9)	51.5	(7.8)
Age	56.5	(6.8)	56.4	(5.7)	56.4	(6.7)	56.6	(7.5)
Tenure in position	4.9	(4.2)	3.9	(2.8)	4.8	(3.2)	5.7	(5.1)
Sales (millions)	2,812.6	(4361)	2,216.9	2,773	2,608.7	3,241.3	3,318.7	5,429
Accounting return on assets (percent)	0.067	(0.075)	0.035	(0.1)	0.097	(0.050)	0.081	(0.047)
Stock market return (percent)	0.142	(0.423)			0.190	(0.356)	0.129	(0.439)
Salary and bonus	164,106	(166,007)	65,166	(33,954)	223,112	(127,592)	206,946	(194,959)
Black-Scholes value of new option grants	36,018	(131,129)			77,430	(162,340)	51,537	(161,149)
Capital gain on preexisting options	1,744	(150,585)			30,261	(193,588)	-5,169	(188,295)
Capital gain on shareholding	239,967	(4,702,226)			10,674	(134,643)	489,415	(6,728,260)
Total change in wealth excluding new option grants	428,540	(4,938,805)	65,166	(33,954)	264,751	(285,715)	721,169	(7,203,215)
Black-Scholes value of stock of options	149,062	(411,199)	0	(0)	328,345	(432,983)	210,950	(512,748)
Value of stock of shares	1,637,469	(12,900,000)	0	(0)	218,879	(562,450)	3,297,419	(18,300,000)
Maximum number of observations	2,921		1,075		414		1,432	
Number of managers	532		241		114		177	
Number of firms	112		41		38		33	
B. 1980-1994								
	mean	standard deviation	mean	standard deviation	mean	standard deviation	mean	standard deviation
Age when first top manager	52.0	(6.6)	53.1	(5.3)	52.6	(5.9)	51.0	(7.6)
Age	56.4	(6.6)	56.4	(5.5)	56.4	(6.7)	56.5	(7.2)
Tenure in position	5.4	(4.6)	4.3	(2.8)	4.8	(3.2)	6.3	(5.7)
Sales (millions)	3,057	(4,823)	2,170	(2,672)	2,608.7	3,241.3	(3,873)	(6,252)
Accounting return on assets (percent)	0.082	(0.077)	0.063	(0.115)	0.097	(0.050)	0.086	(0.054)
Stock market return (percent)	0.173	(0.363)			0.190	(0.356)	0.166	(0.366)
Salary and bonus	193,894	(192,757)	68,002	(35,376)	223,112	(127,592)	253,640	(234,616)
Black-Scholes value of new option grants	57,151	(162,076)			77,430	(162,340)	86,004	(202,086)
Capital gain on preexisting options	2,845	(190,416)			30,261	(193,588)	-8,611	(244,576)
Capital gain on shareholding	307,230	(5,178,727)			10,674	(134,643)	660,334	(7,608,808)
Total change in wealth excluding new option grants	520,083	(5,338,338)	68,002	(35,376)	264,751	(285,715)	908,352	(7,658,182)
Black-Scholes value of stock of options	237,457	(499,553)			328,345	(432,983)	354,096	(627,370)
Value of stock of shares	1,941,727	(15,400,000)			218,879	(562,450)	4,099,453	(22,500,000)
Maximum number of observations	1,833		571		414		848	
Number of managers	428		153		114		161	
Number of firms	112		41		38		33	

Source. Authors' executive compensation database. Privatization year excluded. All data expressed in 1990 pounds.

Table 2. Salary Structure for Top Managers in United Kingdom, 1970-1994

Dependent variable	Dependent variable is ln(salary and bonus)				Dependent variable is ln(salary and bonus and Black-Scholes value of new option grants)			
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
<i>Specification number</i>								
State-owned	-0.581 (0.023)		-0.623 (0.038)***	-0.557 (0.044)***	-0.728 (0.027)***		-0.885 (0.052)***	-0.827 (0.060)***
Privatized	0.031 (0.030)				0.067 (0.041)			
Regulated	-0.213 (0.022)***				-0.227 (0.027)***			
State-owned, talent tier 1		-0.516 (0.034)***				-0.656 (0.038)***		
State-owned, talent tier 2		-0.706 (0.029)***				-0.845 (0.031)***		
State-owned, talent tier 3		-0.533 (0.042)***				-0.627 (0.043)***		
State-owned, talent tier 4		-0.818 (0.020)***				-0.994 (0.025)***		
Privatized, talent tier 1		-0.095 (0.037)***				-0.115 (0.052)**		
Privatized, talent tier 2		0.048 (0.035)				0.071 (0.053)		
Privatized, talent tier 3		0.088 (0.058)				0.123 (0.090)		
Privatized, talent tier 4		-0.261 (0.037)***				-0.216 (0.045)***		
ln(sales)	0.275 (0.008)***	0.269 (0.010)***	0.213 (0.051)***	0.076 (0.040)*	0.282 (0.010)***	0.278 (0.012)***	0.259 (0.061)***	0.105 (0.052)**
Agein	-0.008 (0.001)***	-0.008 (0.001)***	-0.006 (0.002)**	0.051 (0.028)*	-0.012 (0.002)***	-0.012 (0.002)***	-0.008 (0.003)***	0.048 (0.031)
Tenure	0.010 (0.003)***	0.009 (0.003)***	0.004 (0.002)	0.054 (0.030)*	0.000 (0.003)	-0.001 (0.003)	-0.008 (0.003)**	0.028 (0.034)
Ceo	0.168 (0.015)***	0.169 (0.015)***	0.164 (0.015)***	0.185 (0.042)***	0.178 (0.019)***	0.180 (0.019)***	0.171 (0.019)***	0.104 (0.064)
Constant	10.240 (0.105)***	10.263 (0.011)***	10.550 (0.373)***	8.241 (1.827)***	10.483 (0.122)***	10.497 (0.128)***	10.656 (0.456)***	8.575 (2.045)***
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Company fixed effects	no	no	yes	no	no	yes	yes	no
Manager fixed effects	no	no	no	yes	no	no	no	yes
Includes publicly traded firms	yes	yes	no	no	yes	no	no	no
Number of observations	2,443	2,443	1,198	2,443	2,443	2,443	1,198	1,198
R-squared	0.750	0.755	0.885	0.953	0.712	0.718	0.861	0.927

Note. Authors' executive database. Results reported for all top managers. Huber-White robust standard errors. The privatization year has been dropped from all regressions.

* statistically significant at the 10 percent level, ** statistically significant at the 5 percent level, *** statistically significant at the 1 percent level.

Table 3. Other Sources of Total Compensation for Top Executives, 1980-1994

	Black-Scholes value of annual option grants		Black-Scholes value of preexisting options		Value of shareholding	
	Mean	Median	Mean	Median	Mean	Median
A. Build-up around privatization						
Privatization year	165,940	176,980	0	0	31,862	19,527
1 year after	62,541	32,940	153,252	168,010	38,980	24,103
2 years after	68,789	33,379	279,030	254,788	45,700	30,221
3 years after	40,162	0	451,444	446,230	120,886	43,035
4 years after	60,371	0	373,340	238,296	157,706	49,367
5 or more years after	88,531	0	553,496	282,210	423,757	79,168
Publicly traded	54,686	0	269,681	0	4,238,164	103,767
B. Holdings over time						
Privatized 80-84	67,925	0	49,984	0	92,785	9,403
Privatized 85-89	105,620	0	356,442	189,150	292,921	41,521
Privatized 90-94	59,978	0	429,656	275,052	189,895	37,564
Publicly-traded 80-84	36,717	0	76,213	0	3,368,871	37,598
Publicly-traded 85-89	140,318	0	605,926	483,891	7,744,462	114,253
Publicly-traded 90-94	83,916	0	588,655	346,413	4,323,982	132,787
Number of observations	826		826		826	

Source: Authors' executive compensation database. Privatization year not included in Panel B.

Privatization and Management Incentives:

Table 4. Incentives in State-Owned Enterprises

Dependent variable	Dependent Variable is Log Difference in Salary and Bonus					Dependent variable is log difference in wealth	
	Coefficient (1)	Coefficient (2)	Coefficient (3)	Coefficient (4)	Coefficient (5)	Coefficient (6)	Coefficient (7)
Mean							
Accounting returns, 70-94	-0.039 (0.072)					0.029 (.064)	0.041 (.092)
Accounting returns, abnormal ("effort")		0.004 (0.077)					
Accounting returns, industry ("luck")		-0.266 (0.295)					
<i>Prior to reform</i>							
Accounting returns, 70-79			-0.032 (0.117)				
Accounting returns, prior to announcement				-0.008 (0.068)			
Accounting returns water, 73-83					0.409 (1.125)		
<i>After reform</i>							
Accounting returns, 80-94			-0.042 (0.089)				
Accounting returns, after announcement				-0.358 (0.178)**			
Accounting returns water, 84-88					1.230 (0.991)		
Accounting returns in privatized firms						2.540 (.775)***	1.790 (.911)**
Firm Type							
Prior to announcement dummy				0.021 (-0.026)			
Privatized firm dummy						0.239 (.046)***	0.361 (.084)***
Constant	0.017 (0.006)***	0.018 (0.007)***	0.017 (0.006)***	0.011 (0.008)**	2.657 (0.01)***	0.093 (.019)***	-0.688 (.109)***
Year fixed effects	yes	yes	yes	yes	yes	yes	yes
Manager fixed effects	no	no	no	no	no	no	yes
Number of observations	352	352	352	352	89	590	590
R-squared	0.42	0.42	0.46	0.46	0.51	0.35	0.31

Note: Author's executive compensation database. Results reported for top executives. All specifications present Huber-White robust standard errors.
 * statistically significant at the 10 percent level, ** statistically significant at the 5 percent level, *** statistically significant at the 1 percent level

Table 5. Incentives for Financial Performance in Privatized and Publicly Traded Firms (1980-1994)

A. Dependent variable = log difference in wealth tied to the firm

Specification number	[1]	[2]	[3]	[4]	[5]
Privatized firms					
Market returns	0.606 (0.050) ***				
Market returns, abnormal ("effort")		0.643 (0.110) ***			
Market returns, industry ("luck")		0.568 (0.055) ***			
Market returns, first four years			0.664 (0.068) ***		
Market returns, after four years			0.501 (0.070) ***		
Market returns, regulated				0.662 (0.085) ***	
Market returns, not-regulated				0.587 (0.060) ***	
Market returns, government stake					0.570 (0.156)
Market returns, no significant government stake					0.597 (0.052)
Accounting returns	1.164 (0.544) **				
Accounting returns, abnormal ("effort")		0.924 (0.754)			
Accounting returns, industry ("luck")		1.620 (0.774) **			
Accounting returns, first four years			1.158 (0.654) *		
Accounting returns, after four years			1.312 (0.979)		
Accounting returns, regulated				1.780 (0.802) **	
Accounting returns, not-regulated				0.839 (0.777)	
Accounting returns, government stake					-2.821 (2.361)
Accounting returns, no significant government stake					1.473 (0.559)
Publicly-traded firms					
Market returns	0.503 (0.030) ***		0.503 (0.030) ***	0.506 (0.030) ***	0.507 (0.030)
Market returns, abnormal ("effort")		0.485 (0.038) ***			
Market returns, industry ("luck")		0.532 (0.048) ***			
Accounting returns	1.010 (0.379) ***		1.028 (0.379) ***	1.018 (0.380) ***	1.004 (0.378)
Accounting returns, abnormal ("effort")		1.172 (0.407) ***			
Accounting returns, industry ("luck")		-0.286 (0.837)			
Dummy variables					
Privatized dummy	0.075 (0.021) ***	0.089 (0.022) ***			
First four years dummy			0.069 (0.026) ***		
After four years dummy			0.072 (0.030) **		
Regulated privatized firm				0.055 (0.029) *	
Not regulated privatized firms				0.083 (0.029) ***	
Government stake					0.137 (0.064)
No significant government stake					0.071 (0.022)
Constant	-0.009 (0.038)	-0.013 (0.039)	-0.008 (0.038)	-0.007 (0.038)	-0.008 (0.038)
Year fixed effects	yes	yes	yes	yes	yes
Number of observations	734	734	734	734	734

B. Dependent variable= Log difference in salary and bonus

Specification number	Standard		Standard		Standard		Standard		Coefficient
	Coefficient	Error	Coefficient	Error	Coefficient	Error	Coefficient	Error	
	[6]		[7]		[8]		[9]		[10]
Privatized firms									
Market returns	0.104	(0.040) ***							
Market returns, abnormal ("effort")			0.132	(0.089)					
Market returns, industry ("luck")			0.076	(0.045)					
Market returns, first four years					-0.034	(0.054)			
Market returns, after four years					0.226	(0.055) ***			
Market returns, regulated							0.069	(0.068)	
Market returns, not-regulated							0.148	(0.049) ***	
Market returns, government stake									-0.024
Market returns, no significant government stake									0.110
Accounting returns									
Accounting returns, abnormal ("effort")	1.337	(0.439) ***							
Accounting returns, industry ("luck")			1.066	(0.608) *					
Accounting returns, first four years			1.698	(0.624) ***					
Accounting returns, after four years					2.250	(0.515) ***			
Accounting returns, regulated					-0.734	(0.770)			
Accounting returns, not-regulated							2.515	(0.644) ***	
Accounting returns, government stake							0.181	(0.624)	
Accounting returns, no significant government stake									-0.641
									1.457
Publicly-traded firms									
Market returns	0.075	(0.024) ***			0.076	(0.024) ***	0.074	(0.024) ***	0.076
Market returns, abnormal ("effort")			0.060	(0.031) *					
Market returns, industry ("luck")			0.094	(0.038) **					
Accounting returns									
Accounting returns, abnormal ("effort")	0.645	(0.306) **			0.577	(0.299) *	0.634	(0.305) **	0.641
Accounting returns, industry ("luck")			0.623	(0.328) *					
			0.932	(0.675)					
Dummy variables									
Privatized dummy	0.037	(0.017) **	0.046	(0.018) ***					
First four years dummy					0.072	(0.021) ***			
After four years dummy					-0.002	(0.024)			
Regulated privatized firm							0.043	(0.023) *	
Not regulated privatized firms							0.020	(0.023)	
Government stake									0.088
No significant government stake									0.033
Constant	0.028	(0.031)	0.024	(0.031)	0.030	(0.030)	0.028	(0.031)	0.028
Year fixed effects	yes		yes		yes		yes		ye
Number of observations	734		734		734		734		73

Note. Authors' executive compensation database. All specification use robust regressions (STAT rreg command).

* statistically significant at the 10 percent level, ** statistically significant at the 5 percent level, *** statistically significant at the 1 percent level

Table 6. Simulated incentive intensity

<i>Specification number</i>	Percentage change in salary with a one standard deviation improvement in firm performance	Percentage change in wealth tied to firm with a one standard deviation improvement in firm performance	Impact of a one standard deviation improvement in firm performance in terms of pounds (constant 1990 pounds)	Probability of being fired	Change in probability of being fired with a one standard deviation improvement in financial performance	Impact of a one standard deviation improvement in firm performance on total expected compensation (see equation (1)) in terms of pounds (1990 pounds)
	(1)	(2)	(3)	(4)	(5)	(6)
state-owned, prior to announcement	0.0	0.0	-34.1	0.115	0.010	-2410.6
state-owned, after announcement	-2.7	-2.7	-1782.9	0.046	-0.030	6758.1
privatized, first four years	17.5	39.1	176931.3	0.107	0.064	83879.7
privatized, after four years	2.6	32.7	344739.0	0.085	-0.078	442604.1
publicly-traded	8.0	29.7	239376.2	0.048	-0.031	283060.4

Note: Sensitivities of salary and wealth in state-owned firms derived from table 4. Sensitivity of salary and wealth in privatized firms derived from Table 5. Probability of being fired and change in probability of being fired derived from Cragg and Dyck (1999) Table 3 and Figure 4. Change in total compensation with a one standard deviation improvement in firm performance from equation (1) where use the median level of salary and bonus and value of new option grants from 1980-1994 and the average expected tenure by ownership type.

Table 7. Depth of Institutions to Support Privatizations through Share Offerings

	Minimum number of observations	Number of earnings forecasts	Forecast error	Forecast dispersion
Panel A - UK firms, 1987-1994				
UK Benchmark sample of publicly-traded firms	255	14.0	0.167	0.094
UK Privatized firms, all years	253	15.5	0.107	0.080
UK Privatized firms, privatization year	33	10.0	0.046	0.061
UK Privatized firms, fourth year as a privatized company	34	15.7	0.138	0.043
Panel B - International Privatized Firms by level of shareholder protection				
<i>Low anti-director rights</i>				
International Privatized firms, privatization year	73	4.67	0.289	0.164
International Privatized firms, fourth year	75	11.5	0.51	0.167
<i>High anti-director rights</i>				
International Privatized firms, privatization year	39	7.46	0.177	0.159
International Privatized firms, fourth year	46	13.2	0.18	0.099

Source: I/B/E/S summary international history tape. The international sample consists of 159 out of 181 firms identified in Megginson, Nash and Van Randenborough (1994), Boubakri and Cosset (1998) and D'Souza and Megginson (1999). High anti-director rights defined to be 3 or greater and taken from LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1998).
Note: Forecast error is = $|(\text{actual earnings} - \text{the median estimate})/\text{actual earnings}|$
Forecast dispersion= standard deviation of analysts earnings forecasts/(|mean estimate|)

Appendix Table1. Companies and Year Ranges for Each Firm Type

State-owned	Years	Privatized	Years	Publicly traded (All 1970-1994)*
ABP	1970 to 1982	ABP	1983 to 1994	BAT Industries
Amersham	1970 to 1981	Amersham	1982 to 1994	BICC
Anglian Water	1974 to 1989	Anglian Water	1990 to 1994	BLUE CIRCLE Industries
BAA	1970 to 1987	BAA	1988 to 1994	BOC GROUP
BP	1970 to 1979	BP	1980 to 1994	BURMAH CASTROL
British Aerospace	1977 to 1980	British Aerospace	1981 to 1994	British Aerospace
British Airways	1972 to 1986	British Airways	1987 to 1994	CHLORIDE GROUP
British Gas	1972 to 1986	British Gas	1987 to 1994	COOKSON GROUP
British Steel	1970 to 1988	British Steel	1989 to 1994	COURTAULDS
British Telecom	1971 to 1984	British Telecom	1985 to 1994	DELTA
Britoil	1976 to 1983	Britoil	1984 to 1987	FISONS
CEGB	1970 to 1988			GENERAL ELECTRIC
Cable & Wireless	1972 to 1981	Cable & Wireless	1982 to 1994	GLAXO
East Midlands Electricity	1970 to 1990	East Midlands Electric	1991 to 1994	HANSON
Eastern Electricity	1972 to 1990	Eastern Electricity	1991 to 1994	HARRISONS CROSFIELD
London Electricity	1973 to 1990	London Electricity	1991 to 1994	ICI
MANWEB	1971 to 1990	MANWEB	1991 to 1994	JOHNSON FIRTH AND BROWN
Midlands Electricity	1970 to 1990	Midlands Electricity	1991 to 1994	JOHNSON MATTHEY
NFC	1973 to 1981	NFC	1982 to 1994	LAIRD GROUP
		National Grid	1991 to 1994	LAPORTE
National Power	1989 to 1990	National Power	1991 to 1994	LONRHO
NorthWest Water	1984 to 1989	NorthWest Water	1990 to 1994	LUCAS INDUSTRIES
NorthWestern Electricity	1970 to 1990	NorthWestern Electric	1991 to 1994	MORGAN CRUCIBLE
Northern	1971 to 1990	Northern	1991 to 1994	OCEAN GROUP
Northumbrian Water	1974 to 1989	Northumbrian Water	1990 to 1994	PENINSULA AND ORIENTAL
Powergen	1989 to 1990	Powergen	1991 to 1994	RANK ORGANIZATION
RollsRoyce	1971 to 1987	Rolls Royce	1988 to 1994	RECKITT COLMAN
SEEBOARD	1971 to 1990	SEEBOARD	1991 to 1994	SHELL TRANSPORT
Scottish Power	1970 to 1991	Scottish Power	1992 to 1994	SMITH AND NEPHEW
Severn Trent Water	1977 to 1989	Severn Trent Water	1990 to 1994	SMITHS INDUSTRIES
SouthWest Water	1974 to 1989	SouthWest Water	1990 to 1994	TARMAC
SouthWestern Electricity	1971 to 1990	SouthWestern Electric	1991 to 1994	TI GROUP
Southern Electricity	1970 to 1990	Southern Electricity	1991 to 1994	TRAFALGAR HOUSE
Southern Water	1974 to 1989	Southern Water	1990 to 1994	
Swalec	1971 to 1990	Swalec	1991 to 1994	
Thames Water	1974 to 1989	Thames Water	1990 to 1994	
Welsh Water	1974 to 1989	Welsh Water	1990 to 1994	
Wessex Water	1984 to 1989	Wessex Water	1990 to 1994	
Yorkshire Electric	1971 to 1990	Yorkshire Electric	1991 to 1994	
Yorkshire Water	1984 to 1989	Yorkshire Water	1990 to 1994	
National Coal Board	1970 to 1994			
ThePostOffice	1971 to 1993			

Note: British Aerospace was publicly traded from 1970-1976 (prior to nationalization).

Footnotes

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¹ See also Bös and Peters (1986) and Vickers and Yarrow (1991).

² See for example Boardman and Vining (1989) and Dewenter and Malatesta (1997).

³ Evidence about the benefits of privatization comes from a variety of sources including detailed case studies (e.g. Galal et al., 1994), in-depth studies of particular countries (e.g. LaPorta and Lopez-de-Silanes, 1997), and cross-country studies of privatizations in developed and developing countries. These and other empirical studies are surveyed in Megginson and Netter (2001), Nellis (1998), and Sheshinski and Lopez-Calva (1999). Studies of incentives include Wolfram's (1998) investigation of compensation using salary and bonus in privatized UK electric distribution companies and Cragg and Dyck's (1999) investigation of links between management turnover and firm performance changes in privatized UK firms.

⁴ To encourage dispersed ownership, the government took active steps to make small investors aware of the privatization program, to reduce their transaction costs in buying shares (by establishing share information offices, allowing shares to be purchased through local banks and share shops, allowing installment payments), to give preferential allocations for small quantity applicants and employees when demand exceeded supply, and to provide loyalty bonuses for share retention.

⁵ The probability that any privatized firm would potentially be subject to disciplinary takeovers was reduced by the large size of the privatized firms, and by the government maintaining a 'special share' in many firms. This share prohibited any person, or group of persons acting in concert from controlling more than 15 percent of the equity of the company without prior government approval. More than seven eighths of the major privatized companies were sold with a special share. See HM Treasury (1995) for further information on the special share.

⁶ New state-owned firms created since 1975 and added to our database are British National Oil Company, British Aerospace and Nuclear Electric. Excluded firms because they were broken into many small parts include National Bus, British Ship Builders and the Rover Group.

⁷ For firms with both an active Chairman and a Chief Executive, we include both decision makers as top executives.

⁸ We do not examine differences in non-monetary compensation such as titles or perquisites such as offices, cars, etc.. Managers in publicly traded firms can and do receive such honors,

and government reports suggest non-measured perquisites are not higher in state-owned firms (Review Body on Top Salaries, 1980).

⁹ This dummy variable takes the value of 1 for the electricity and water distribution companies, British Airports Authority, British Gas, and British Telecom and 0 for other privatized companies

¹⁰ Review Body on Top Salaries (1974: 41).

¹¹ This report defined six salary tiers. We combined two that were very close (and where we had very few firms) to construct four salary tiers. If a firm was designated in a salary tier, if it was deconstructed at the time of privatization, all of its constituent parts are assigned to the same tier (e.g. CEGB was broken into National Power, Powergen and Nuclear Electric and all were assigned to the same tier as CEGB). In addition, Rolls Royce was not covered in this review and we defined it to be in the top salary tier.

¹² To arrive at this percentage we take the anti-log of the state ownership dummy variable (with publicly traded as the omitted category), $0.44 = 1 - e^{-0.581}$. We also explored median regressions to ensure our results were not driven by outliers. The median regressions deliver an almost identical ownership type discount of 43 percent.

¹³ The figure is based on a regression (not presented) of the log of salary and bonus on ownership type in different time periods, management characteristics, firm size, and industry dummies.

¹⁴ The regression (not presented) controls for manager, firm, industry and year fixed effects and is based on the estimated coefficients for time relative to privatization.

¹⁵ For simplicity, we present return on assets as our accounting measure. We found comparable results using return on sales, and percentage change in profits.

¹⁶ We define the beginning period wealth as the flow income that period in salary, bonus and new options and the stock of wealth defined by share and option holdings. We then estimate for each manager in each period the change in wealth associated with that periods financial and market returns to construct an end of period value for wealth. We take the log difference of these two values.

¹⁷ All of the results reported below are robust to the inclusion of these factors.

¹⁸ The elasticity of salary and bonus to accounting returns was -0.039 and is now -0.042 . The elasticity of total wealth for state-owned firms remains indistinguishable from zero (was 0.029 and is now 0.00) and for privatized firms was 2.54 and is now 2.65 .

¹⁹ The results are similar to average estimates of 0.1 to 0.17 reported in Rosen's (1992) survey of the US literature. Our findings for the UK are slightly lower than those reported in Main, Bruce and Buck (1996) and, within the range of findings from a similar survey of the UK literature by Conyon, Gregg and Machin (1995).

²⁰ Our estimates for publicly traded firms are similar although slightly lower than UK findings reported by Main, Bruce and Buck (1996) where, using a slightly different specification, they estimate elasticities ranging from 0.71 to 0.90 .

²¹ The elasticity of compensation to market returns remains virtually unaltered and maintains its level of significance. The elasticity of total compensation (salary and bonus) to market returns was 0.606 and remains 0.606 for privatized firms (from 0.104 to 0.101). For publicly-traded firms the elasticity was 0.506 and is now 0.503 (from 0.075 to 0.074). The

elasticity of total compensation (salary and bonus) to accounting returns also retains its significance and is within the same range as reported above. It was 1.164 and is now .864 (from 1.337 to 1.25). It was 1.01 and is now 0.811 (from 0.645 to 0.526).

²² The majority of the executives interviewed were either Chairman or Chief Executive Officer with other executives sitting on the board or heads of divisions or functional areas. The interviewed executives had experience under state ownership and as new hires since privatization. The privatized firms included electric generation firms, water supply companies, the electric distribution companies, British Airports Authority, and Cable and Wireless.

²³ Top Salaries Review Body (1974), p. 59.

²⁴ Top Salaries Review Body (1980: 3). Subsequent quotations relate to this document.

²⁵ There were exceptions. A number of managers commented for example on the £1.8 million bonus granted to Ian MacGregor for his tenure at the National Coal board where he saw the firm through the divisive coal strike.

²⁶ The experience of managers in Seeboard, a regional electric company, is fairly typical of the privatized firms we surveyed. The increased probability of dismissal was reflected in the firm replacing its finance director, internal auditor, managing director for supply, as well as its chairman and chief executive officer all within one year of privatization.

²⁷ We dropped observations if they were for a manager whose firm experienced an accounting change in a reporting year and we were unable to collect consistently reported data before the change. We also dropped observations for electric distribution and supply

companies and for National Coal in 1984 and 1985 as there was an extraordinarily low return that year due to the coal mining strike.

²⁸ Datastream has a series of adjusted prices, which adjust raw prices to account for stock splits and other capital actions.

²⁹ In particular, shares are taxed when underlying shares are sold, not when options are exercised, and they are taxed at the capital gains rate rather than the income tax rate. See Main, Bruce and Buck (1996) for further information.

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