Management Control and Privatization in the United Kingdom: A Quiet Life Disturbed

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Abstract

This paper investigates the hypothesis that privatization produces a tighter alignment of managers' rewards and penalties with owners' objectives. To test this hypothesis, we compile qualitative and quantitative data on management change from 96 UK state-owned, privatized and private firms between 1970-1995. Our data set includes management resignation information, various firm performance measures, manger-specific attributes, industry-specific attributes and controls for economy-wide trends. We find strong evidence of a statistically and economically meaningful relationship between the probability of dismissal and firm performance changes in privatized firms and not in state-owned firms. Simulations using predicted coefficient estimates and mean managerial and firm characteristics show that an increase in performance from one standard deviation below the mean to one standard deviation above the mean reduces the probability of being fired in privatized firms by more than 50% but has no effect in state-owned firms.

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I - Introduction

Margaret Thatcher's innovative sell-off of UK state-owned firms in the 1980s catalyzed a global wave of privatization. Operating in more competitive product markets, privatized firms' output, profits, and share prices have predominantly increased while prices facing consumers have usually not grown (Galal *et. al.* (1994), Megginson *et. al.* (1994)). This paper investigates the hypothesis that private ownership contributes to these improvements by enhancing managerial incentives, promoting a tighter alignment of managers' rewards and penalties with owners' objectives. We test the hypothesis that private owners provide more effective internal control using government documents, interviews, and panel data on management change for 96 UK state-owned, privatized and private firms between 1970-1995. To paraphrase John Hicks (1935), we investigate whether privatization works by disturbing "the best of all profits" of state-ownership - a quiet life.

Critics of UK privatization, both in the press and academic circles, often suggest that aside from increasing manager's salaries, privatization didn't significantly alter corporate governance relationships. After all, UK state-owned firms were organized the same as any public corporation with a board of directors that monitored and disciplined management and the firms were audited by independent financial accountants. This skepticism of differences in governance between state-owned and privatized firms is bolstered by recent reports of considerable laxity of governance in privately owned firms. Even granting superior control mechanisms in private firms, critics note how the privatization process appeared to be designed specifically to mute forces normally associated with active governance with considerable limitations on product market competition, ownership concentration, and takeover threats. Bishop and Kay (1988), in a comment on the privatization of British Gas, offer an opinion typical of much of the British literature, "there is little caricature in describing this privatization as a deal between ministries and an industry chairman (each unenthusiastic about the proposal) in which the latter accepted privatization in return for an assurance that it would not really make any difference."[1]

Advocates of privatization, and managers themselves, counter that compensation changes are simply a reflection of dramatically changed managerial responsibilities and oversight systems introduced by private owners. Property rights and political theories of ownership and incentives support this contention. Additionally, the documentary record on governance in state-owned enterprises, and interview evidence from managers in privatized firms suggest significant governance changes with privatization.

However, there is surprisingly little empirical evidence to corroborate these claims. Most research on differences between public and private ownership do not examine changes in efficiency in the same firms with privatization but rather look at cross-sectional efficiency differences between state-owned and privately-owned firms offering similar services (Boardman and Vining (1992) provide a meta-analysis of 90 studies). Examinations focused more directly on privatization (see Megginson *et al* (1994)) or on contracting out (see Donahue (1989)) document performance changes but have not focused on collecting data to evaluate how privatization works. In former socialist economies, where some attention has been focused on control changes, empirical work has found more evidence for

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[1] Bishop and Kay (1988), p. 88

the importance of management change than incentive reforms (see Barberis, *et. al's* (1995) study of the privatization of Russian shops, and Dyck's (1993) study of management transfer in eastern German privatization). Moreover, Groves *et. al* (1995) finding of significant improvements in incentives in China in the absence of privatization brings into question the need for ownership change.

Resolution of the debate about whether privatization works through improved managerial incentives is important for at least three reasons. First, without demonstrated changes in incentives it is difficult to defend privatization efforts. As conventional economic analysis suggests, privatizing firms with some monopoly power is socially costly unless the ownership change improves managerial effectiveness by enough to offset distributional and efficiency losses arising from reduced government control over firm decision making.[2] The reports of dramatic increases in managerial compensation without any evidence of increased incentives for managerial efficiency in the UK, for example, threatens both the freedom of action granted to newly privatized firms and efforts to expand the privatization program. Additionally, if UK privatized firms do not demonstrate more effective control, what hope is there for improved governance in countries introducing privatization that have inactive and poorly functioning capital markets?

Second, understanding how privatization works might help to design better privatization programs. For example, if privatization produces significant changes in managerial rewards or penalties, this questions the desirability of privatization programs, such as the Russian program, that entrench management and constrain active governance by giving managers large ownership stakes. Third, examining privatization's impact on governance mechanisms tests property rights and political theories of the relationship between ownership and incentives. The detailed microeconomic data might also help refine formal models of the relationship between ownership and incentives.

To determine the sensitivity of governance measure to performance, the empirical literature on corporate control measures in privately owned firms focuses on the use of performance-related pay, and/or the sensitivity of management replacement to firm performance. Studies in both the US and the UK (Jensen and Murphy (1990), Rosen (1990), Conyon, Gregg, and Machin (1995)) document the statistically significant, albeit economically small, relationships between compensation and performance changes in established private firms. Weisbach (1988), Warner, Watts, Wruck (1988), Kang and Shivdasani (1995) and Kaplan (1994) have shown that disciplinary turnover is related to firm performance in private US, Japanese and German firms.

This paper compiles quantitative UK data to explore the changes in the sensitivity of management turnover to various performance measures prior to and post privatization. The UK is an excellent testing ground, for a large number of firms have been privatized and data on management and firm performance is reliable and accessible. We construct a comprehensive panel data set of 96 state-owned, privatized and private firms, including all of the medium to large firms under state ownership in the 1970s. The data set includes management resignation information, various firm performance measures, manager-specific attributes, industry-specific attributes and controls for

[2] For formal models see Bös and Peters (1986) and a simplified exposition in Vickers and Yarrow (1988).

economy-wide trends. Because state-owned firms were constrained from using compensation as a device to align objectives, disciplinary turnover is perhaps a fairer test of the relationship between corporate control and firm performance. Following our examination of resignation in state-owned and privatized firms we compare these results against a benchmark sample of privately owned firms.

Our results provide strong evidence consistent with the hypothesis that privatization significantly increases managerial incentives. Relative to state-owned firms we find that privatized firms exhibit both a significantly higher incidence of firing and a much stronger sensitivity of firing to firm performance. Simulations using predicted coefficient estimates and mean managerial and firm characteristics show that an increase in firm performance from one standard deviation below the mean to one standard deviation above lowers the probability of being fired in privatized firms by more than 50 percent while it has little or no effect on disciplinary turnover in state-owned firms. Simulations also show a predicted fire rate almost double that of state-owned firms. These results suggest that privatization does indeed change the serenity of managers' lives.

The paper proceeds in 6 sections. In section 2, we provide an overview of the UK privatization program. Section 3 motivates our empirical analysis by presenting arguments and evidence about the relationship between ownership and incentives. Section 4 describes the data and methodology used to study changes in corporate governance. Section 5 presents and analyzes our empirical results while Section 6 concludes.

II - UK Privatization

This section motivates our empirical examination of corporate governance changes with privatization. To frame our discussion of governance changes, we briefly outline the extent of state ownership and important features of the privatization program.[3]

By 1979, when Margaret Thatcher was elected Prime Minister, nationalized industries accounted for almost one tenth of UK gross domestic product and one-seventh of investment. Three phases of government activity contributed to this expansive state role in the production of goods and services. Prior to World War II, state ownership was limited and stemmed largely from concerns about natural monopolies and the strategic importance of industries such as oil and airways. Following the 1946 election of a Labour government ideologically devoted to "common ownership of the means of production, distribution and exchange,"[4] the government significantly increased its ownership of industry. Over the next three years, the government nationalized the Bank of England, coal, railways, electric supply, gas and the iron and steel industry (sold back to the private sector in 1951). Later nationalizations included the takeover of industries on the brink of bankruptcy such as British Leyland, British Shipbuilders and Rolls Royce and the renationalization of the iron and steel industry in 1967.

The Thatcher government's privatization program stopped and reversed the trend of increasing direct government involvement in production of goods and services. Firms with a stronger financial situation and

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[3] For more extensive discussions of the privatization program see Vickers and Yarrow (1988), Bishop and Kay (1988), and Yarrow (1989).

[4] This excerpt is taken from clause IV of the Labour party constitution. This clause was only removed in 1995.

operating in relatively competitive markets, such as the international telephone company Cable and Wireless and Amersham, a manufacturer of radioactive materials for healthcare and industrial uses, were privatized early. Under the Thatcher and Major governments, all state-owned firms of appreciable size that offered goods and services to the public, with the exception of the Post Office, were privatized or slated for privatization. The pace of privatization increased with the sale of large firms with considerable monopoly power starting with British Telecom in 1984, followed by British Gas in 1986, the water and sewage companies in 1989, and the electric supply industry in 1990 and 1991. Table 1 details companies included in the privatization process.

<insert Table 1 about here>

The privatization process usually provided for a complete sale of government stakeholdings through an initial public offering. This allowed private owners to use their powers of voice and exit to increase managerial effectiveness. Large institutional shareholders, experienced in supervising management, eagerly sought shares in privatized firms in the initial share offerings. These institutional shareholders could also increase their shareholdings through purchases on the stock market where privatized companies' shares have been actively traded.[5] Additionally, there few set-asides for incumbent managers, limiting their ability to entrench themselves

Consistent with experience elsewhere, UK firm's financial performance has generally increased following the announcement of privatization plans and the introduction of privatization. Table 4 presents descriptive statistics of our data set showing the considerably higher levels of performance in privatized firms relative to the period of state ownership. Galal *et. al* (1994) in a more limited and detailed study found that social welfare gains from just the privatization of British Telecom, British Airways and National Freight Corporation equaled more than £ 10 billion.[6] Suggestive of increased consumer surplus, consumers have experienced few price increases and quality of service indicators have not fallen.[7]

< Insert Table 2 about here >

III - Ownership and Incentives in the UK

Skepticism of Links between Ownership and Incentives

Skeptics offer strong arguments to question the existence and importance of significant incentive changes with privatization. From a theoretical perspective, it is not transparent why private owners should be any more effective than public owners at resolving agency problems arising from the separation of ownership and control. Consistent with these concerns, there is evidence of laxity of governance in privately-owned UK firms. The empirical record of improved firm performance with privatization can also legitimately be challenged or attributed to

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[5] The National Freight Corporation is a notable exception. Its shares were sold to management and employees.

[6] They defined social welfare gains as equal to the change in consumer and producer surplus plus changes in the rents earned by competitors. Their measure also considers changes in the overall level of economic activity.

[7] In water and sewage, where prices have risen, the revenues from these increases have been reinvested in significant quality improvements to meet new European Community guidelines.

other factors than ownership. Finally, the privatization process insulated incumbent management from many pressures associated with well functioning capital markets.

Two influential reports on weaknesses in governance in private firms published in the early 1990s, the Cadbury and Greenbury Reports, fanned skepticism that privatization would improve management control.[8] The Cadbury report characterized boards in private firms as instruments of the Chairmen since executive directors voted in-line with their chairman, non-executive directors typically only comprised a minority on the board, and non-executives rarely determined executive compensation. The Greenbury report focused more directly on weaknesses in the design of compensation plans. It noted the lack of performance-related pay, a limited emphasis on long-run performance measures and excessive executive control of compensation setting. Empirical studies such as Gregg, Machin and Szymanksi (1993) confirm the weaknesses in governance highlighted by these reports. These weaknesses have begun to be addressed, but the extent of effective governance is still in doubt.[9]

The performance improvement surrounding privatization are not necessarily the result of the change in ownership. Table 2, panel B shows that total factor productivity and other measures of performance rose in many firms before privatization occurred and in firms which have not been privatized. Further clouding the statistical picture is the fact that for many firms, privatization coincided with a liberalization of the sector and an increase in competitive pressures. Perhaps the change in the competitive environment, and not the change in ownership, accounts for these performance improvements.

Additionally, the government constrained active governance through features of the privatization process. Firms usually were not broken up with sale thus reducing potential product market competition Further, the government limited initial share concentration by reserving significant portions of share issues for the general public, often at significant discounts. This policy reportedly reduced the probability of renationalization and secured political benefits from privatization for the Conservative party. It also made active corporate governance more difficult.

The government also attempted to preempt public concerns about privatization by retaining a "special share" in most enterprises. The special share constrained the market for corporate control by requiring any suitor interested in acquiring more than 15% of a firm to seek government approval. The experience of the electricity supply sector suggests the power of this constraint. Privatized in 1990, the restrictions on takeovers lapsed in April 1995. Within a year there were ten takeover attempts of regional electric companies. The special share also granted the government the right to veto appointment of non-British nationals to key management positions in firms such as British Telecom and Cable and Wireless.

More to the point, many UK critics characterize the whole privatization process as a deal specifically designed to reduce risks to managers. The *Financial Times*, for instance, had this to say,

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[8] See Percy (1994) for a summary of the Cadbury report and its recommendations.

[9] Since June 1993, the London stock exchange has required all listed firms to publish their compliance with the Cadbury Code of Best Practice. Corresponding with the increased scrutiny has been a rapid increase in the number and influence of non-executive directors and a redesign of compensation plans

> Suppose a schoolboy was asked to observe the sale of British Gas and then explain the meaning of the term privatisation... The Boy, if really bright, would realise that privatisation also entails a change in the status of a large and powerful company. Yet it is a change which seems to have few material consequences: the company does not get split up or experience a change in mangement. The crucial thing is that the process of 'going into the private sector' seems to make the chairman, government ministers, a place clalled the City and his parents very happy.[10]

These criticisms have been echoed across the globe, for most countries have introduced similar restrictions on active governance.

Support for Incentive Changes with Privatization

Despite these criticisms, there are equally strong arguments that privatization did have a significant impact on incentives and governance. Property rights theories predict increased managerial incentives with privatization because private owners have a greater financial interest and ability to implement appropriate reforms. In a state-owned firm, the Minister has no financial interest in the returns stemming from his actions (or inaction) while private owners' financial returns are a function of firm performance. If the current ownership team fails in its efforts, it can be replaced by a new ownership team through a takeover. The shift of ownership from the state to private owners also clarifies property rights allowing increased use of financial incentives to align interests of owners and managers. The increased ability to transfer ownership stakes with privatization encourages the creation of a measure that capitalizes the impact of present managerial efforts on a firm's long-run value leading to more effective incentive arrangements.[11] Additionally, the ownership transfer reduces the ability of other stakeholders such as unions to constrain managerial activity, increasing the value of incentive arrangements.

Political theories of privatization (Boycko, Shleifer, Vishny (1996)) also predict a closer alignment of managerial rewards and penalties with firm's financial performance following privatization. In their view, privatization improves performance by insulating management from political goals that conflict with efficiency. As they argue, "the critical agency problem that explains the inefficiency of public firms is the agency problem with politicians not with managers."

Documentary Evidence

The UK documentary record provides evidence consistent with both property right and political theories of a link between ownership and incentives. Below, we emphasize three weaknesses in the agency relationship in state-owned firms. They reportedly lacked clear objectives, there were severe information asymmetries between managers

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[10] *The Financial Times* editorial, November 26, 1986. The editorial was cited in Vickers and Yarrow (1988), p. 425. Helm (1988), describing the privatization of the electricity industry, is even more skeptical, "managers will maintain and even enhance their control through privatisation. They will, in all practical matters, be answerable only to themselves. The assumption that they will nevertheless pursue shareholders' interests is as naive now as it was in 1947 when the shareholder became the government." p.6.

[11] The multi-task principal agent models of Holmstrom and Milgrom (1991, 1994) show the need to tailor the level of incentive provision to the information that is available.

and Ministers, and there were few effective systems to encourage accountability. Constant criticisms of existing control mechanism and considerable changes in these mechanism are indications of these governance problems.[12]

Interestingly, the UK government constructed governance mechanisms in nationalized firms to mimic the standard US/UK shareholder--board of directors--management relationship. The Minister of the Department responsible for the nationalized firm, as the voice of the sole shareholder, had considerable potential powers, appointing all directors and approving borrowings, investment projects and distribution of surpluses. Fearful of excessive political interference, however, Ministers were directed by statute only to give general directions to the board and management. Indicative of this "arms-length" approach, nationalized firms were incorporated as public corporations separate from their sponsor ministries with control rights delegated to a board of directors. Parliamentary questions about day-to-day management were not allowed and the Comptroller and Auditor General of the Ministry were not permitted to scrutinize the firms' accounts.

Weaknesses in this system of "arms-length" control were recognized by the government in a series of government White Papers in 1961, 1967, and 1978. A principal criticism, highlighted in the 1961 report, was a lack of clarity of owners' objectives. The report characterizes the standard policy direction as demanding that "revenues should on an average of good and bad years (or some similar phrase) be not less than sufficient to meet all items properly chargeable to revenue."[13] Neither the method for accounting for depreciation nor the number of years was specified. Managers and boards were left to decide on the appropriate tradeoffs between commercial and non-commercial objectives.

An underlying difficulty with attempts to improve control measures such as objective setting was incumbent managers' manipulation of information. A Select Committee of the British Parliament reported serious information difficulties: "The corporations have the advantage of detailed knowledge of the specific commercial environment and access to the information they need, while the civil servants are largely reliant on selective information provided by the corporation."[14] Managers appeared to use this information to pursue their own objectives. For example, managers of the Central Electricity Generating Board, an institution dominated by engineers, were able to convince the government to invest in sufficient capacity to meet 20-25% above overly ambitious predictions of peak demand. As a result, there was massive overinvestment in just the sort of new generation construction that top engineers liked and that made executives day-to-day job of "keeping the lights on" relatively easy.

The record also suggests the direction of management toward political and away from commercial objectives, and limited managerial discretion. As the National Economic Development Office (NEDO) reported in a comprehensive evaluation of nationalized industries: Ministers "did not make any detailed attempt to satisfy

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[12] The NEDO report (1976) and the 1961, 1967 and 1978 White Papers on Nationalized Industries provide detailed discussions of corporate governance in nationalized industries. Overviews of their findings are presented in Vickers and Yarrow (1988) and Heald (1980).

[13] HM Treasury (1961).

[14] Select Committee On Nationalised Industries, p. 30.

themselves on the financial or economic validity of the programmes."[15] Illustrative of the manipulation of firms toward political objectives was the direction of nationalized industries in the late 60s and early 70s to limit price increases to well below inflation in advance of government macroeconomic goals. Revealing more detailed interference, politicians fearful of electoral costs of increased unemployment slowed down restructuring in the steel and coal industries, forced managers in the Central Electricity Generating Board to rely on more expensive British coal and British manufactured plants, and instructed British Airways management to use British-made planes instead of Boeing, their preferred choice.

The Top Salaries Board, tasked with determining appropriate compensation systems for managers of nationalized firms, summarized the differences in managerial tasks as follows:

> The freedom of nationalised industry Chairmen to formulate and implement policy is more circumscribed than in private industry, in that they have responsibilities to Ministers and are subject to Parliamentary scrutiny. They are called up to run their industries in circumstances of changing objectives, over which they have no direct control, and these may well not coincide with the long-term interests of the particular industry.[16]

There is scant evidence that boards attempted to mitigate agency costs through wage and dismissal policies. Viewed as government employees, the government constrained both the level and form of compensation for managers in state-owned enterprises. Remuneration arrangements required the approval of the Prime Minister and the Minister for the Civil Service and were reviewed by the Review Body on Top Salaries. Salary levels were consciously set between that offered in the private sector and that found in government. Indicative of political constraints on wage setting in the 1970s, the government rejected recommendations of the Top Salaries Review Board and effectively froze managerial wages at their 1972 levels until 1978 in spite of considerable inflation. This policy aggravated existing wage gaps between managers in state-owned and private firms. This wage gap likely contributed towards lower quality management and reduced motivation as suggested in the 1977 Annual Report for Eastern Electric, "We, the part-time members of Eastern Electricity Board, deplore the continuing failure of the Government to remunerate adequately our Chairman and deputy Chairman ... and are deeply concerned... at the effect on the succession and over time on top management's dedication to their role." There were reports of poorly performing managers being replaced and of many frustrated managers quitting but no systematic evidence whether dismissal was actively used as a mechanism to align owners' and managers' objectives.

Reflecting the condemnation of corporate governance measures provided by the 1976 NEDO report, the 1978 White Paper heralded a series of new governance reforms rapidly implemented by the Thatcher government elected in 1979. The most important feature of the new system was the identification of three easily monitored targets: financing limits, financial return measured by rate of return on net assets and efficiency measured by unit cost of operation. Although theoretically in conflict with each other, these targets were relatively easy to monitor and hardened the firm's budget constraint. Accountability was enhanced by a requirement to publish both targets and

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15 National Economic Development Office (1976) p. 88.

16 Review Body on Top Salaries (1974), p.43.

performance relative to past targets in annual reports. Additionally, starting in 1981, the government removed oversight of nationalized industries salaries from the bureaucratic Top Salaries Review Board and began to close the gap between salaries of private and public sector managers, in some cases experimenting with performance related pay.[17] Perhaps the most important incentive for managers was the pending threat (or reward) of privatization. Table 3 reveals the increased use of financing limits and setting of financial targets in the 1980s.

These governance changes tightened managerial control after 1979 but certainly did not eliminate suspicions of agency problems in state-owned firms. At the heart of the agency problem, managers continued to control firm-specific information allowing them to influence target setting. In addition, Ministers and managers continued to lack strong financial incentives for improved performance. The compensation reforms were limited and there were few instances of significant performance-related pay.[18]

< Insert Table 3 about here >

Interview Evidence

Managers provide perhaps the most compelling case for significant incentive changes with privatization. To investigate perceived changes in the owner-manager-agency relationship with privatization, and to refine our empirical analysis, we visited the UK in spring of 1996 and interviewed managers who had remained in their positions through the privatization process. We interviewed an average of two senior executives in 5 privatized firms, senior representatives from two regulatory agencies, and a representative from the Treasury. The privatized firms included firms from the electric generation industry (a highly concentrated industry with increasing competition), the water and sewage companies (a regulated monopoly), British Airports Authority (a regulated monopoly with partially competitive elements), and Cable and Wireless (operating in competitive markets).

In each interview, the executive was asked his opinion of how privatization had changed the firm's and the managers' challenges and opportunities. Following these general questions, executives were queried about the various external and internal pressures theory suggests would arise with privatization and deregulation, and more specific questions related to their firm or industry. In particular, managers were asked about the extent of product market competition, credit market pressure (e.g. credit rating agencies, attempts to raise capital through bond or new stock issues), pressures stemming from large and small shareholders, pressures from regulators, and changes in manager's rewards and penalties.

Contrary to skeptics of privatization and again consistent with property rights and political theories of incentive changes with privatization, managers reported significantly more tangible links between penalties, rewards and firm performance. For example, one manager highlighted the link between the firm's share price and his job prospects, "The primary reason we focus on the market is our personal reputation. The minute we lose shareholder

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[17] Review Body on Top Salaries (1981).

[18] A notable exception was the £1.8 million bonus for American Ian MacGregor for achieving performance targets as Chairman and Chief Executive of British Steel

support out personal survival is on the line. The threat of firing is an extraordinarily strong motivation." Another commented on the changes in reward mentality,

> Financial rewards change culture faster than anything - if they are big enough. Financial rewards make you do what they (the owners) want you to do. Previously people had been paid to come to work, with modest incentives introduced in the mid to late 1980s all negotiated with union representatives. The bonus, however, maxed out at 7.5% for top people. With privatization all this changed, at first 100 and then later 600 people were placed on personal contracts which removed the Trade Unions from negotiations. Strict monetary bonus is now maxed at 30% with the most ever paid equal to 24%. In addition, there have been extensive use of share options.
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> Look at that television set over there with a listing of stock market prices, that is something you would not have seen ten years ago. I now have it on all day, every day. If there are big changes in the price I want to know soon and find out why.

Non-monetary rewards also changed, as recounted by a Deputy regulator, "In the old days, the requirements of a good manger was to be a jolly good engineer who had worked in the industry for 20 years. Today, you are the guy if you've cut the costs. Not only is there market pressure but the chaps in the club evaluate you this way as well."

These reported incentive changes coincided with increased managerial discretion that made firm performance more a function of managerial actions. As an executive in the water industry noted, "Privatization has changed our ability to manage our own destiny."[19] As an example, a number of managers pointed to the ability to make long-term investment plans, which were previously discouraged by the government's use of external finance limits whose level could change arbitrarily from year to year. Managers also welcomed the ability to diversify into non-core businesses both within the UK and abroad. Previously, statutory restrictions had sometimes explicitly disallowed efforts to expand outside their core business, and certainly to expand abroad. Managers also noted that they were encouraged to take risks that were not previously considered.

The increased discretion did not imply an elimination of government intervention but a change in the nature of intervention from active interference to an ability to stymie management plans. For example, the government would hold up planning approval for construction projects if the firm neglected to pay attention to consumer interests. Similarly, the regulator required that a firm "ring fence" its core business with explicit rules on transfer pricing between regulated to non-regulated businesses.[20]

Incentive increases also coincided with a greater influence of owners in setting firm objectives. This made objective attainment a stronger test of managerial ability and effort. In all cases, managers reported that financial analysts, including analysts of large institutional shareholders, were considerably more active and effective in projecting firm cash flow under various assumptions than were government officials. For example, market analysts impose similar projections for retail sales in BAA as they introduce for other retailers. Market analysts also benchmark the firm against international comparison firms. As a result of these analyses, firm management felt that

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19 For reasons of confidentiality, we do not include names of interviewed executives.

20 See Byatt (1996) and Ofwat (1995).

they had to define objectives within the range of private sector forecasters with an unambiguous increase in expected financial performance relative to the period of state ownership.

The following comments from executives and by John Moore, Financial Secretary to the Treasury (1983-1986) show the perceived change in power from management to analysts and institutional investors,

> Officially (under state ownership) the Treasury set performance targets for financial returns and productivity. In reality the Treasury was bamboozled. We had all of the information and we determined our own targets. That has all changed with privatization. Now financial analysts are poring over our analyses. They send us weekly and monthly updates to us and to our non-executive directors. We have to propose financial targets in line with analysts expectations. More importantly, the market holds us to account. We fail to hit that number and the stock market price takes a hit. Don't think that our shareholders aren't aware. To address this we work hard, especially at mid year. In extreme cases, we will hold back discretionary spending. (executive 1)

> We are a big company and our stockholders tend to be institutions. The investors are clear about what they want. You should not underestimate the power of analysts. They don't tell you what to do but their line of questioning highlights areas of concern. You have how many employees producing how much? Did I hear you right? What is your expected profit? In addition, they hold you to account. You have to hit that number. (executive 2)

> There is no question that diffused, massive share ownership is more comfortable for management. But in the modern world - and I speak as an investment banker now - people underestimate the pressure of rational capital markets, the pressure of analysts, the pressure of institutions for efficiency. It is my view from many years of experience in the financial world that widespread diffuse ownership does not lead to management laxity or prevent proper strategic decision making.[21] (John Moore)

Two other interesting comments provided by the interviews were a suggestion of significant management change independent of performance, and a link between incentives and the level of product market competition. Managers noted that prior to and following privatization, owners realized that new managerial skills were required to compete in the private sector. Individuals sought most actively were those with a financial background who could discuss firm performance with financial analysts, and individuals with experience in sales and marketing. Managers were unable to identify the separate contributions of increased ownership pressure and increased competitive pressure. These forces were almost universally characterized as complementary, with board supervision being tighter and discipline more rigid where firms were operating in more competitive markets.

A Need for Empirical Analysis

The preponderance of evidence offered by the qualitative record supports the contention that incentives changed significantly with privatization. This evidence, however, is incomplete. Difficulties of interpretation motivate a more rigorous analysis of the available evidence that we turn to now in the next section.

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21 Quoted in Galal, et. all (1993), p. 40.

IV- Quantitative Approach and Data

The principal hypothesis we empirically test is that the change in ownership following privatization increases board oversight which should be reflected in increased sensitivity of disciplinary management turnover to firm performance. Guided by economic theory and the institutional record, we allow the resignation decision to be a function of firm performance, manager attributes, industry attributes and economy wide trends. To investigate our hypothesis we collected comprehensive information on management change and firm performance for 96 state-owned, privatized and privately owned UK firms. This section describes our data collection efforts, variable definitions and descriptive statistics. The next section presents and describes the results of the regression analysis.

Data

We started our data collection efforts by identifying all of the medium to large size UK public corporations in 1975 that became candidates for privatization.[22] We excluded from our analysis any firms that became a disparate collection of small firms, were small to begin with, or were essentially non-commercial.[23] We were able to collect data for 33 state-owned firms and 32 privatized firms with an average of 12.5 years of data from the period of state ownership and 7.4 years for each privatized firm.

To benchmark our results we also collected similar management and performance information from 31 firms that remained privately owned throughout the time period. The privately owned firms met the following criteria: the information agency *Datastream* had data on firm performance going back to the 1970s; copies of the firm's annual reports going back to the 1970s were available in Harvard's Baker Library; firms were at least as large as the second smallest nationalized firm in 1970; and, firms were in similar sectors and/or exhibited similar sales volatility to nationalized industries in 1975. Table 1 in the Appendix provides a list of firms and descriptive statistics of similarities apparent in 1975.

We used company annual reports as the primary source for our information on firm management and performance. To locate annual reports for nationalized firms we contacted 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. We followed our initial letter with phone and fax contact. In many cases, the firm's Chief Archivist provided a copy of the annual reports from 1970 to privatization which we supplemented with annual reports available from commercial services since privatization. For firms that were unwilling or unable to provide information we used other channels including archived copies from Harvard University's Baker Library, UK public libraries, and libraries of the Department of Trade and Industry and the Treasury. While we were not able to

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[22] Remaining nationalized firms are British Railways Board (to be privatized in 1996), Scottish Transport Group, National Ports Council Dock Labour Board, Port Authorities, Development Agencies, Northern Ireland Corporations, Housing Bodies, Passenger Transport Executives, Bank of England, British Broadcasting Corporation, Civil Aviation Authority, Independent Broadcasting Authority, HMSO, National Savings Bank, Property Services Agency, Royal Mint, Royal Ordnance Factories, British Nuclear Fuels, Short Brothers and Harland.

[23] Therefore, we excluded National Bus, British Ship Builders, Data Recording Instruments, Ferranti, Herbert, KTM Machine Tools, the National Film Finance Corporation, National Research Development Board, Sugar Board, and Export Credits Guarantee Department.

collect information for all firms in our sample group (e.g. we are missing 5 of 12 regional electric companies and 2 of 10 water and sewage companies) our data set is quite comprehensive including every major privatized firm.

It was easier to locate data for private firms. For management information we consulted archived annual reports (1970-1980) and copies of annual reports from microfiche and CD-ROM (1981-1995). We used *Datastream's* standardized data on accounting earnings and asset levels for firm performance variables and industry performance information. Table 2 in the Appendix describes the variables we use, their definitions and sources.

Defining Top Management and Management Change

We identified management resignations using two definitions of top decision makers in each firm. Following Weisbach (1988) and other studies we first focus attention on the most important decision makers in each firm, what we call the "top executives." The top executive is defined as the firm Chairman unless the Chairman is clearly not an active member of the firm in which case we use the Chief Executive Officer. For firms with both an active Chairman and a Chief Executive, we include both decision makers as top executives. 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. Since these two titles do not always correspond with an individual's real decision making power, we also follow Warner, Watts and Wruck (1988), and Denis and Denis (1995) and collected information on "top management." Our definition of "top management" includes all individuals with the titles Chairman, Deputy Chairman, Chief Executive Officer or Managing Director.

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. If the titles of individuals in the top management team were shuffled, but there was no change in team composition, we do not record a management change. For most companies, annual reports covered the period from April 1 to March 31.

Defining Resignations as Fires or Quits

To determine whether board control was sensitive to firm performance we used qualitative information on reported reasons for departure and age information. We classified each management resignation as a disciplinary turnover (fire), when the board elects to fire an executive, or a voluntary turnover (quit), when the executive elects to leave to pursue outside opportunities including better jobs and leisure. Our principal information sources were: press reports about the resignation in *The Financial Times* (post 1981); new appointment announcements in *The Financial Times* (post 1981); and, because press reports were not available on-line prior to 1981, biographical information reported in *Who's Who* (pre 1981). We completely read all articles and *Who's Who* entries before classifying a resignation as a quit or a fire. When these sources provided no information or the information was ambiguous, we read company annual reports at the time of resignation, occasionally consulted books on company history, and relied more heavily upon age information.

Some reported reasons for departure were straightforward enough to allow us to classify resignations with little doubt. We defined a resignation as a voluntary departure where the reported reason was death or health

concerns, or when the manager clearly took an equal or greater position in a similar firm. For example, Ian MacGregor's shift from the Chairmanship of British Steel to British Coal in 1983 is coded as a voluntary turnover as were resignations when the Chairman of one regional electric company left to become Chairman of a larger regional electric company. We defined a resignation as a disciplinary turnover when the press report indicated that the manager was fired, or the departure resulted from board conflict, or where the manager clearly took another position at a lower level or in a much smaller firm.

Other reported causes of resignation provided less information about the reason for departures and we therefore relied more heavily upon age information to identify quits and fires. In particular, the most often stated reasons for departure were "retirement", or we found that the manager took no new position. Both of these reported reasons could indicate a voluntary departure or could be a euphemism for a manager being fired. We classified these resignations as voluntary if the manager had reached retirement age and as disciplinary turnover otherwise. Because many company annual reports indicated a company retirement age of 62 (although some also reported 65 or no retirement age), we used this as our age cutoff. To control for the possibility that our age cutoff is too low, we include a variable indicating if the manager was 62, 63, 64, or 65 in all of our regressions.

Performance Variables

We used accounting earnings as our primary indicator of firm performance. Accounting earnings measures were available for all of the firms in our data set for the complete time period. Accounting earnings is a measure of short-run profitability and is related, albeit imperfectly, to the firm's long-run profitability. There is evidence (Cosh (1975), Korn/Ferry) that boards of directors use accounting earnings in determining bonuses, and one would expect to see the same relationship with dismissals. The use of accounting earnings follows similar examinations of managerial turnover in the US by Weisbach (1988) and Denis and Denis (1995). We do not focus our empirical analysis on stock market prices because state-owned firms had no stock market price.

To account for possible weaknesses in accounting measures we examined four performance measures. Each performance measure is the *change* in accounting returns normalized by net operating assets, net assets, sales or earnings. These in turn are called return on net operating assets (RONOA), return on net assets (ROA), return on sales (ROS) and percentage change in income. Earnings is defined as operating income after depreciation but before interest and taxes. Net operating assets is defined as total assets (fixed and current) less current liabilities (total assets less current liabilities). Net assets are defined as net operating assets less long term liabilities. It was infeasible to use total assets to normalize the change in earnings since most firms did not separately report current assets and liabilities, just providing one net current liabilities figure. Beginning in 1981, many firms switched their accounting to current cost from historical cost and we use current cost measures after this point.

Changes in accounting-based performance measures conveys more information about managerial control in state-owned firms than one might expect. As mentioned above, nationally owned firms were organized as public corporations and their annual financial accounts were audited by the same private accounting firms and according to the same standards as for privately-owned firms. The government made efforts to quantify the cost of non-commercial objectives and provided grants to the firms to cover these costs. For example, when the government

imposed unexpected price controls on nationally owned firms in the 1970s, the government provided a grant roughly equal to the foregone income as a result of price controls. As a result, changes in financial performance were related to managerial efforts. In addition, if non-commercial objectives do not vary dramatically over time, Ministers should focus on changes in financial performance. And if non-commercial objectives do vary over time, but similarly across all nationalized firms, this effect will be picked up in our time trend variables.

Accounting earnings also have their weaknesses. Asset values can be dramatically affected by changes in accounting rules leading to changes in accounting earnings that are not attributable to management. Accounting rule changes are particularly likely at the time of privatization. We limit the possibility that are results are driven by accounting changes by providing numerous different performance measures and by excluding the privatization year from our descriptive statistics and regression results.

Control Factors: Manager-specific attributes

To help isolate the impact of ownership on corporate governance, we control for three management-specific attributes that might influence the decision to quit or be fired and that could change with privatization. These attributes are age, tenure and compensation relative to opportunity cost. A manager's age does not influence firing but increases a manager's probability of quitting as an older manager likely has a higher valuation of leisure time, or lower valuation of his wage income. Managerial tenure is likely to reduce both fires and quits for the longer a manager remains in a position the more likely he/she has found a better match, the greater the likely investment in firm-specific human capital, and the greater opportunity the manger will have had to influence board composition and disciplinary mechanisms. We also control for compensation differences because a manager likely bases his quit decision on his compensation relative to his opportunity cost and the documentary record suggests wage freezes in state-owned enterprises. A growing wage gap should increase the probability of voluntary departure but should not affect fires if we are classifying fires correctly.

Many sources provided manager-specific data. We collected the manager's age from company annual reports, *Who's Who* and on-line press reports from the *Financial Times*. We constructed the tenure variable by identifying the year each manager assumed a top executive position. We used press reports, *Who's Who* and company annual reports to identify a starting year even for managers who entered our data set in the middle of their spell. The notes to the audit statement of the annual reports provided information on management compensation. Since the 1967 Company Act, all firms have been required to provide this information. We collect the exact wage of the highest paid director, often the exact wage for the Chairman (when not the highest paid director), and salary ranges for the remaining board members where we used the midpoint of the salary range. The reported compensation information does not include pension plan contributions or the value of stock options.[24] If performance related pay was listed separately we included it in determining aggregate management compensation.

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[24] Thus, our compensation information provides a lower estimate of the changes associated with privatization and the compensation levels of privately owned firms. It was infeasible to include stock option information as firms did not provide information on the strike price and exercise rights associated with their options.

We define a manager's opportunity cost to be median wages for a top executive in a comparable firm. Managers of state-owned firms likely view another job in the state sector as their outside opportunity and look at wages of other managers in nationalized industries. For example, a manager of a smaller regional electric supply company will leave his job to take a similar position in a larger electric supply company that offers higher compensation. For privatized firms, the reference group is likely to be wages in the private sector. We construct a wage gap for each manager by subtracting from a manager's own salary the median salary for the relevant reference group in that year.

Control Factors: Industry Attributes and Time Dummies

To provide a more accurate measure of how boards of directors might evaluate firm performance, we also include control variables for industry performance, the extent of product market competition in the industry and time dummies. Boards of directors interested in rewarding or penalizing changes in firm results attributable to management efforts should not use raw performance data but should examine how the firm has performed relative to other firms operating in similar economic environments. Accordingly, boards should not penalize (reward) managers when industry performance deteriorates (improves) but only when firm performance relative to industry performance declines (improves). One way to examine whether boards are making relative performance comparison is to include industry performance in addition to firm performance. In this set-up, the coefficient on industry performance should be opposite to that on firm performance and significant.[25]

Above and beyond the industry effect, there might also be a positive relationship between the extent of product market competition and active governance. In competitive firms, boards probably find it easier to identify changes in performance attributable to managerial activity. In case of lax management, firms will experience more rapid loss of profits and market share, and the presence of comparison management teams allows the board to control more effectively for industry performance. We capture this possible effect by introducing dummy variables to identify firms facing low and high levels of competition. We introduce time dummies to account for the possible time trends in board supervision suggested by the institutional record.

We constructed comparable industry performance measures for each private and privatized firm in our data set by including all firms in the *Datastream* database with the same *Financial Times* industry classification and excluding the target firm. We used value to determine the weights for the industry performance measures. The *Financial Times* industry classification provides fairly broad industry classes, identifying industries at a level comparable to somewhere between a two and three digit standard industrial code (SIC). In private firms, the industry adjustment factor we constructed includes all privately owned firms in the same industry classification. For nationalized firms the industry adjustment factor also includes state-owned firms in the same *Financial Times* industry class.

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[25] Gibbons and Murphy (1990), among others, have shown that relative comparison helps to explain variations in observed management compensation

When a nationalized firms did not have at least two comparison firms we broadened the definition of industry by including our subjective valuation of the next closest industry class. For example, because British Gas had only one comparitor in the industry classification "Gas Distribution," we expanded its industry class to include "Integrated Oil Producers." Similarly, because British Airways lacked a comparitor for most of our sample period we extended its classification to include "other transport." The "other transport" category included British Airports Authority, Associated British Ports, the National Freight Corporation and some private sector companies. Using this technique we were able to define industry comparison measures for all firms except the Post Office, where we adopted a much broader industry measure including British Telecom, and all electric and water companies.

We found it difficult to define non-controversially the extent of product market competition facing a firm, particularly as many firms operated in domestic and foreign markets and the extent of product market competition changed over time. A full analysis of the extent of product market competition for each firm and at each period of time was beyond our scope for this paper. Instead, using subjective criteria based on our reading of the literature, we classified firms into three groupings that we defined as firms facing relatively low levels of product market competition, firms facing a strong level of competition, and firms that we felt uncomfortable classifying into either of these categories. We defined British Gas, British Telecom, The Post Office, British Airports Authority and firms in the electric supply and water industries as firms facing a low level of competition. While privatization did loosen regulations and introduce potential competition, it did not introduce real domestic competition by 1995 for these firms. To ensure that the coefficient on this variable was not driven by the large number of firms in the electric and water sector we included separate dummies for these sectors. We identified Rolls Royce, Amersham, British Petroleum, Britoil and Cable and Wireless as firms operating in relatively competitive sectors. We classified the remaining firms once under state ownership as firms with an unclear level of competition. These firms were: Associated British Ports, British Aerospace, British Airways, British Steel, National Coal and the National Freight Corporation.

Summary Statistics

In Tables 4-5 and Figure 1 we present descriptive statistics of our dependent and independent variables that suggest interesting differences between state-owned, privatized and private firms. We excluded the actual year of privatization from this table and all of our regression results because of accounting changes coinciding with privatization and the difficulty of accurately identifying who made board decisions during this year.

Turning first to performance, Table 4 shows significant differences in the level of performance between state-owned firms, on one hand, and privatized and private firms, on the other. The historically weak performance of state-owned enterprises is reflected in a return on net operating assets in state-owned enterprises averaging less than half that in privately-owned firms. The increase in average performance with privatization is reflected in the significantly higher *level* for return on assets in privatized firms. Examining *changes* in the return on assets or return on sales one sees a different pattern with a slightly positive average return for state-owned firms and almost no trend in private or privatized firms over the 1970-1995 period. Perhaps the relatively strong performance of state-owned enterprises reflects these firms low starting level for performance. While privatization is often associated with

significant performance improvements, there are a number of notable exceptions. The graphs of trends in rate of return on assets following privatization show that approximately one-third of privatizations were followed by deteriorated financial performance.

< Insert Table 4 about here >

In figure 1 we document the pronounced differences in real compensation levels between state-owned, privatized and private firms suggested by the documentary record. Real top executive compensation fell during the 1970s and the gap between public and private firms remained steady at approximately 40,000 pounds (1990). The decline in real compensation in the 1970s was likely encouraged by the high inflation and poor firm performance during this time period. In 1982, top executive compensation in private firms began to escalate rapidly. Only in 1989 do top executive wages in nationalized industries show a similar rise. Somewhat surprisingly, top executive wages match their private sector counterparts upon privatization prior to 1989-1990.[26]

Focusing on our dependent variable, management change, Table 5 panel A shows significantly more management resignations in state-owned and privatized firms relative to private firms. The average turnover rate in our sample of top management is 12 percent for the full sample, with a relatively high rate of 14 percent and 15 percent for nationalized firms and privatized firms respectively and a significantly lower rate of 10 percent for private firms. Similar patterns are found when we restrict our attention to top executives with an overall turnover rate of 12 percent and turnover rates of 15, 14 and 11 percent for nationalized, privatized and private firms. The average implied tenure for top management and top executives is 8.3 years.[27]

These turnover rates in UK firms are similar to those found in studies for the US, Germany and Japan. Denis and Denis (1995) and Weisbach (1988) report annual average turnover rates of 9.3 percent and 7.8 percent for CEOs in their samples. Kaplan (1994) studied management and board turnover for a sample of 42 large western German corporations between 1981-1989. He reports an annual average turnover rate of 10.9% for the chairman of the management board and 9.9 percent for a member of the management board. Kang and Shivdasani (1995) report an average turnover rate of 12.9 percent for their sample of President turnover in Japanese corporations.

We find signs of the hypothesized heightened governance activity in privatized firms relative to state-owned enterprises when we distinguish resignations between fires and quits. Panel B shows the reasons for departure gleaned from combining our data collection efforts from *Who's Who*, press reports, and age information. Of the 347 examples of turnover found in our data set, we classify 65 percent of all turnovers as voluntary, and 35 percent as disciplinary. Suggestive of slightly more active control mechanism in privately owned firms, 32 percent of management turnover in privately owned firms is disciplinary relative to 28 percent for state-owned firms. More strikingly, 59 percent of all turnovers since privatization are classified as disciplinary -- 50 percent higher than the estimated turnover rates for other types of ownership. Another interesting result is the high level of quits in state-owned enterprises.

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[26] The fall in top executive wages in privatized firms in 1989 and 1990 is a compositional effect reflecting the privatization of the electric and water supply industries where compensation was lower.

[27] The increase in turnover in nationalized firms in the 1990s is based on very few firms.

While these results do suggest more active governance in privatized firms, they cannot confirm whether board control of management is more closely related to performance. To fully investigate this relationship, we now turn to our regression framework.

< Insert Table 5 about here >

V - Results

This section presents the results from our regression analysis. In any year simultaneously the manager makes the decision to remain or quit and the board makes the decision to retain or fire the manager. To account for the three possible states a manager could occupy in any year - fire, quit, or remain - we employ a multinomial logit specification. The basic set-up, presented in equation 1, shows how we allow the resignation decision for manager i at time t to be a function of the change in performance of the manager's firm (firm j), manager specific attributes (age, tenure, compensation relative to opportunity cost), industry-specific attributes (industry performance change, extent of product market competition), time trends, and ownership type. We allow changes in firm and industry performance to differ by ownership type.

(1) $$resignation_i^t = f(perform\Delta_j^t, man\_attributes_i^t, ind\_attributes_j^t, time, owner\_type_j^t)$$

We first present results comparing the sensitivity of management resignation between state-owned and privatized firms. Then we turn our attention to a similar analysis of privatized and private firms. We conclude this section with a brief discussion of some of our results. To focus our presentation, we present results using only the top executive definition of managers. The more expansive top management definition yielded very similar results with lower levels of statistical significance.

Turnover Sensitivity in State-owned and Privatized Firms

Table 6 presents our main findings. The top half of the panel presents the fire coefficient estimates and the bottom half presents the quit coefficient estimates. The first pattern and the highlight of our findings, is that in privatized and *not* nationalized firms, a top executive is significantly more likely to be fired when the firm had a bad year -- when the rate of return on assets declined. This result is robust to different measures of performance and is similarly found if we use cumulative changes in return on net operating assets over the two years prior to dismissal (results not presented). The second pattern to notice in the four specifications is that privatized firms have higher fires and significantly lower quits than state-owned firms. The descriptive statistics suggested such a relationship and this is confirmed by the positive coefficient on the privatized firm variable after controlling for firm and top executive-specific attributes. Privatization appears to significantly change the serenity of managers' lives.

The more significant relationship between disciplinary turnover and firm performance in privatized firms is seen most clearly if one compares the predicted probability of firing contingent upon performance as we have done in Table 7. Using predicted coefficient estimates and mean managerial and firm characteristics, we have compared the average probability of being fired when firm performance has increased by a standard deviation to the average probability of being fired when firm performance has decreased by a standard deviation. We normalize this difference

by the predicted probability of being fired. Table 7 shows that a performance increase of this magnitude in a privatized firm lowers the probability of being fired by more than 50 percent while it has little or no effect in state-owned firms. Table 7 also shows a considerably higher mean predicted fire rate of 6% in privatized firms, more than double the rate in state-owned firms.

< Insert Tables 6-7 about here >

The regression results for the manager-specific control variables support our contention that we have both correctly identified fires versus quits and also that the model is consistent with economic intuition. As predicted, age has no impact on fires, but a statistically significant positive impact on quits (retire). Furthermore, quits are most likely around typical UK retirement dates and fires are unlikely to occur in this period. Similarly, we find as expected that a manager's opportunity cost, measured as the gap between own wages and those in the public or private sector, has a negative (albeit statistically insignificant) impact on quits. Given that there is likely considerable measurement error in compensation, attenuation bias is likely to bias this coefficient to zero and raise its standard error.

Turning to the regression results for the industry control variables we find evidence of more fire activity in firms facing more significant product market competition but do not find evidence that boards are making relative performance comparisons. The statistically significant negative coefficient estimate for the low competition variable signals a significantly lower fire probability for managers of firms in a sector with a low level of competition relative to managers of firms operating in a fully competitive sector. The coefficient on industry performance measures are not equal in sign and opposite in magnitude to coefficient estimates on firm performance as suggested by theory. Rather, industry performance has the same negative sign as firm performance, although the coefficient is not statistically significant. This result may arise because boards are not using relative performance comparisons, it could reflect coding errors of quits for fires, or top executives might be preempting a future dismissal.

These results are not an artifact of time trends in governance activity and privatization efforts. We ran numerous specifications including time dummies for each year, time dummies for half decade periods, and time dummies by decade. The specification used in this table just includes time dummies to account for the Thatcher years (1979-1989) and for the 1990s. Using more extensive time dummies, individual coefficient estimates were insignificant and the inclusion of these variables had little impact aside from the reported time dummies.

Turnover Sensitivity for Privatized and Private Firms

To help understand the relative strength of control mechanism in privatized firms, we also compared the sensitivity of turnover between privatized firms and firms that were always under private ownership. The documentary record suggests that time trends were important, and we allowed for the effect of firm performance on fire and quit probabilities to vary before 1980 and after 1980.

Table 8 presents our main findings from these regressions. First, consistent with our hypothesis of the effect of ownership on governance, we find that disciplinary turnover is also negatively related to changes in firm performance in firms that remained under private ownership throughout the time period. However, consistent with reports of lax governance in private firms, this finding is not statistically significant. The results are more

pronounced (higher coefficient estimates) although still not statistically significant after 1980. Particularly prior to 1980, top executives in private firms seemed insulated from firm performance.

The differences between private and privatized firms are again seen most clearly by comparing the changes in the predicted probability of being fired when firm performance changes as presented in Table 7. After 1980, when performance rose by two standard deviations in private firms, this reduced the likelihood of being fired by nearly 50 percent. As with the coefficient estimates, we see that prior to 1980, private managers enjoyed almost complete isolation from any responsibility for firm performance. Second, consistent with the coefficient estimates, Table 7 shows the lower mean predicted fire rate and higher quit rate in privatized firms relative to private firms.

< Insert Table 8 about here >

An examination of manager-specific control variables again supports our contention that we have both correctly identified fires versus quits and also that the model is consistent with economic intuition. As predicted, age has a small negative impact on fires but a large positive impact on quits. We also note that in addition to fires being more sensitive to firm performance in the 1990s, fires were also higher (insignificant). The regression results for industry-specific control variables shows a continuing lack of support for the contention that boards are using relative performance comparisons. The coefficient estimates on product market competition remain consistent with theories of positive relationships between competition and governance, but these results are no longer statistically significant. The differences between this result and that presented in the previous section could arise because a private owner's interests in maximizing profits might substitute to some extent for product market competition.

Discussion

Our interpretation of the evidence as showing a relationship between ownership and incentives appears more compelling than reasonable alternatives not related directly to ownership. A possible explanation for the differences in the level of management turnover between privatized and state-owned firms, and perhaps for the sensitivity of turnover to firm performance, could be that the government privatized firms with bad management first. New owners of privatized firms, aware of this, might be particularly sensitive to poor firm performance resulting in a higher level of fires and increased sensitivity of fires to performance. This argument of information revelation through the timing of privatization is logically consistent but has little validity. A reading of the documentary record suggests that firms with good management and performing well tended to be privatized early. This suspicion is confirmed by a steady decline in the level of performance for newly privatized firms over time regardless of the chosen performance measure. This biases results in the other direction, and makes our results that much more striking.

An interesting finding suggested by the descriptive statistics and confirmed in our regression analysis was the overall higher level of fires in privatized firms than all other firms. This evidence is consistent with the proposition advanced by Dyck (1993) and Barberis *et. al*(1995) and reflected in our management interviews that privatization requires significant changes in human capital. The overall higher fire rate therefore might reflect the board's replacement of managers without these skills with new managers possessing such skills. The finding is also consistent with the hypothesis that the years surrounding privatization present an extraordinary opportunity to

identify managerial ability. To maintain returns on assets in the more competitive environment, it was quickly apparent that newly privatized firms needed to reduce costs which often called for a radical firm restructuring, downsizing and often diversification. With greater managerial discretion, managerial ability was likely to be revealed more quickly. For example, the cost of diversification policies are clear as a bad decision is expensive and has poor returns relatively quickly. The closer relationship between fire probability and firm performance in privatized than private firms supports this second interpretation.

Another interesting finding was the higher level of quits in state-owned firms than all other firms even after controlling for other factors. This might help to explain the relative poor performance of state owned enterprises. Because of the higher turnover rates, state-owned firms needed to invest more than other firms in training new managers and suffer longer periods of supervision under new management. Among the possible explanations for this finding are: a low level of compensation relative to the private sector, managers frustration with their limited discretion, or a mislabeling of fires as quits.

We end this section on a cautionary note. Our result of a greater sensitivity of disciplinary turnover to financial performance does not show that government-owned enterprises were not monitored and controlled. As suggested by political theories of privatization, government owners might simply have been targeting other objectives.

VI - Conclusions

We interpret our main empirical findings that disciplinary management turnover is more closely related to financial performance in privatized firms than state-owned firms as strong evidence for the hypothesis that ownership has a significant impact on managerial incentives. Contrary to the expectations of many British academics and the UK Press and in spite of constraints on active governance, private owners aligned managers incentives with owner's financial interests. In fact, while top executives in private firms became more accountable for firm performance following the publication of the Cadbury and Greenbury Reports and the consequent heightened awareness of UK shareholders, the likelihood of a top executive's dismissal in a privatized firms is even more closely tied to firm performance than that in private firms. With stronger incentive alignment, privatized firms should over time exhibit higher efficiency and improved performance.

Our results lend support to privatization efforts and question the need or desirability of active government oversight of managers in privatized firms. Probably to the surprise of many executives in privatized firms, the market for corporate control appears to function effectively in disciplining poor managerial performance. More work needs to be done to see if the same incentive changes are found for managerial compensation, and if ownership changes also leads to incentive changes in countries with less well functioning markets for corporate control.

Our results of a higher level of fires in privatized firms and a heightened sensitivity of dismissals to firm performance, however, brings into question privatization efforts that reduce the ability to replace managers. Human capital change seems to be an important element of the restructuring process. Privatized firms that find it difficult to

replace managers, such as Russian firms where management often has a significant ownership stake, will find it more difficult to implement needed changes.

Finally, contrary to the skepticism of simple agency theory, and consistent with both political and property rights theories, ownership affects incentives. More work is needed to discriminate between property rights theories, that suggest limited government attention to any objectives under state ownership, and political theories, that suggest government attention to non-commercial objectives. In other words, was the government targeting other objectives, and are control mechanisms related to these other objectives? Finally, the finding of a significant relationship between ownership and incentives can hopefully prompt greater efforts to identify in formal models why incentive provision is less likely in state-owned firms.

Appendix Table 1 Description of Firms

Panel A - Firms Included in Data Set

State-owned firms	Privatized firms	Privately-owned firms
Amersham International (70-82)	Amersham (82-93)	BICC (70-94)
Associated British Ports (70-83)	British Shipbuilders (83-94)	B.A.T. Industries (71-94)
British Aersopace (77-81)	British Aerospace (81-94)	British Aerospace (70-77)
British Airports Authority (66-87)	BAA (87-94)	Blue Circle (78-94)
British Airways (72-87)	British Airways (87-94)	BOC (70-94)
British Gas (72-86)	British Gas (87-94)	Burmah Castrol (70-94)
British National Oil Company (76-82)	Britoil (82-86)	Chloride group (70-94)
British Petroleum (70-79)	BP (79-94)	Cooksons Group (70-94)
British Steel (71-88)	British Steel (88-94)	Courtaulds plc (70-94)
British Telecom (71-84)	BT (84-94)	Delta (70-94)
Cable and Wireless (72-83)	Cable and Wireless (83-94)	Fisons (70-94)
National Coal Board (70-94)	Britcoal	General Electric plc.(71-94)
National Freight (73-82)	NFC (82-95)	Glaxo (71-94)
The Post Office (71-93)		Hanson Trust (76-94)
Rolls Royce (71-87)	Rolls Royce (87-94)	Harrison & Crosfield ltd. (70-94)
Central Electricity Generating Board (70-90)	National Grid (90-94)	ICI (70-94)
	National Power (90-94)	
	Powergen (90-94)	
Nuclear Electric (90-94)		Johnson Firth Brown Ltd. (73-94)
Scottish Power (70-92)	Scottish Power (92-94)	Johnson Matthey (70-94)
Eastern Electricity (72-90)	Eastern (90-94)	Laird (70-94)
East Midlands electricity (70-90)	East Midlands (90-94)	Laporte Industrie (Holdings) ltd. (71-94)
London Electricity (73-90)	London Electricity (90-94)	Lonrho (70-94)
Midlands Electricity (70-90)	Midlands (90-94)	Lucas (70-94)
North Western Electricity Board (70-90)	NORWEB (90-94)	Morgan Crucible (70-94)
Southern Electricity Board (70-90)	Southern (90-94)	Ocean Group (72-94)
South Western Electricity Board (71-90)	Southwestern (90-94)	Peninsular and Oriental (70-94)
Anglian Water (74-89)	Anglian (89-94)	Rank Organization . (70-94)
Northumbrian Water (74-89)	Northumbrian (89-94)	Reckitt and Coleman (70-94)
Northwest Water (84-89)	Northwest Water (89-94)	Shell Petroleum (70-94)
Severn Trent Water (80-89)	Severn Trent (89-94)	Smith and Nephew (71-94)
Southern Water (83-89)	Southern Water(89-94)	Smiths Industries (70-94)
Thames Water (78-89)	Thames Water (89-94)	Tarmac (70-94)
Welsh Water (74-89)	Welsh Water (89-94)	TI Group (70-94)
Wessex Water (84-89)	Wessex Water(89-94)	Trafalgar House (70-94)
# of firms with data = 33	# of firms with data = 32	# of firms with data = 31
average # years of data = 14.7	average # of years of data = 7.4	average # of years of data = 23.8

Panel B - State-Owned and Private Firms, 1975 (millions of £)

	Mean	Standard Error	Median	Minimum	Maximum	Count
state-owned - 1975 sales	963	384	307	15	7781	21
private - 1975 sales	727	202	344	62	5781	32
state-owned - 1975 net operating assets	791	276	223	10	5140	23
private - 1975 net operating assets	524	149	261	52	3831	31

Appendix Table 2 Description of Variables

Variable	Description	Source
Manager definitions		
Top Executive	Executive Chairman and Chief Executive Officer.	Company annual reports.
Top Management team.	Executive Chairman, Executive Deputy Chairman, Chief Executive Officer, Managing Director.	Company annual reports.
Turnover definitions		
Turnover	The last year a manager was in a top executive position for more than 6 months of reporting year. Could also have turnover in first 6 months of next reporting year.	Company annual reports.
Turnover = fire	Defined as fire if: press reports list fire or board conflict, press or annual reports report retired & <62, *Who's Who* reports no new position & < 62, other board position in firm & <60, lower post in other firm, removed in control change, unclear & <62.	*Financial Times* on-line press reports, *Who's Who* , company annual reports, books.
Turnover = quit	Defined as quit if: press reports list ill health or death, press and annual reports report retired & > 61, *Who's Who* reports no new position or unclear & >61, Equal or better position in similarly situated firm, other board position & >59.	*Financial Times* on-line press reports, *Who's Who* , company annual reports, books.
Owner objective definitions		
One year ROA change	Change in the ratio of operating income before interest and taxes to net assets in last year where manager was top executive for more than 6 months.	Company annual reports for state-owned/ privatized firms, and *Datastream* for private firms.
One Year RONOA change	Change in the ratio of operating income before interest and taxes to net operating assets in last year where manager was top executive for more than 6 months.	Company annual reports for state-owned/ privatized firms, and *Datastream* for private firms.
One Year ROS change	Change in the ratio of operating income before interest and taxes to sales in last year where manager was top executive for more than 6 months.	Company annual reports for state-owned/ privatized firms, and *Datastream* for private firms.
Percentage change in profits	Percentage change in operating income before interest and taxes.	Company annual reports for state-owned/ privatized firms, and *Datastream* for private firms.
Other variables		
Industry performance change	Change in performance measure for all UK firms in *Datastream* international with same *Financial Times* industry classification (value weighted) excluding target firm.	Financial data from *Datastream International* .
Intensity of product market competition	Variable identifies firms in sectors facing intense product market competition, minimal competition and unclear levels of competition. See text for exact classification.	Annual reports and *Datastream International* .
Tenure of Manager	Number of years in one of top four executive positions in firm.	Company annual reports, *Who's Who.*
Age of Manager	Age	Company annual reports, *Who's Who* and press reports.
Compensation relative to median	Manager's wage relative to median compensation of all managers that year in same type of firm (state-owned, privatized, private).	Company annual reports.

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Table 1 - Major Privatizations

Company	Date of Sale	Date of Announced Privatization	Number of employees at privatization
British Petroleum	October 1979	December 1976	not available
Cable and Wireless	October 1981	March 1981	10,750
British Aerospace	February 1982	July 1979	79,300
Amersham International	February 1982	December 1981	2,049
National Freight Consortium	February 1982	April 1979	24,500
Britoil	November 1982	January, 1982	2,527
Associated British Ports	February 1983	July, 1980	9,000
Jaguar	July 1984	May 1983	9,500
British Telecom	November 1984	July, 1982	239,000
British Gas	December 1986	May, 1983	89,747
British Airways	February 1987	July, 1979	40,252
Rolls Royce	May 1987	1985	38,995
British Airports Authority	July 1987	1983	7,462
British Steel	December 1988	December 1986	54,900
Water and Sewage firms (10)	December 1989	1986	40,000
Regional Electric firms (12)	December 1990	1988	84,000
Generating companies (2)	February 1991	1988	23,900

Sources: For dates of sale and employees, *Her Majesty's Treasury Guide to the UK Privatisation Programme*, August 1995. For announcement dates, Company annual reports, Fraser, R. and M. Wilson, "Privatization: The UK Experience and International Trends," *Kessing's International Studies* (London: Longman Group UK Limited), 1988, "Denationalisations: Les Lecons de l'Etranger," A. Barbe, W. Butler, J.M. Messier, Y. Rolland, P. Vieillard, eds. (Paris: Economica), 1986.

Table 2 - Productivity and Welfare Effects of UK Privatization to 1990

Panel A

Enterprise	Welfare Effects of Privatization (£ millions)					
	Total	Govt.	Employees	Shareholders	Competitors	Consumers
British Telecom	9,999	2,247	0	3,721	-121	4,151
British Airways	680	316	0	772	-84	-323
National Freight Corporation	223	-11	194	41	0	0
Totals	*10,902*					

Panel B

Enterprise	Annual Change in Total Factor Productivity		
	1979-1990	1979-1983	1983-1990
British Airports Authority*	1.0	-1.6	2.6
British Coal	2.6	-0.8	4.6
British Gas*	1.0	-1.0	2.2
British Rail	1.2	-2.9	3.7
British Steel*	6.4	4.6	7.5
British Telecom*	3.5	3.0	3.7
Electricity Supply	1.5	-0.3	2.6
Post Office	2.3	1.7	2.7
Average	*2.4*	*0.1*	*3.7*

* privatized in 1983-1990 period
Sources: Bishop and Kay (1991), Galal et. al (1994)

Table 3 Government Objectives in a Sample of Nationalized Firms

Enterprise	Target	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
National Freight corporation	Financing limit (£ millions)	n.t	n.t	2	58	35	32	?	24	7	n.t.	p	p	p	p	p	p
	Target return on assets (%)	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	p	p	p	p	p	p
British Airports Authority	Financing limit (£ millions)	n.t	n.t	1	12	4	1	0	20	14	48	33	10	-21	15	p	p
	Target return on assets (%)	15.5	15.5	15.5	n.t.	n.t.	n.t.	n.t.	6	6	6	4.1	6.3	7.3	6.2	p	p
British Gas	Financing limit (£ millions)	n.t	n.t	186	-36	-268	-172	-449	-400	-317	-75	-8	-100	-352	n.t.	p	p
	Target return on assets (%)	7	n.t.	n.t.	8	n.t.	n.t.	n.t.	3.5	3.5	3.5	4	4	4	4	p	p
British Steel	Financing limit (£ millions)	n.t	n.t	332	950	950	875	700	450	730	350	195	275	360	146	66	-100
	Target return on assets (%)	8	8	8	8	n.t.	n.t.	n.t.	0	n.t.	n.t.	n.t.	0	n.t.	5	?	?
National Coal Board	Financing limit (£ millions)	n.t	n.t	165	289	376	625	709	834	886	1026	1111	1103	723	730	727	670
	Target return on assets (%)	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	n.t.	0
Electric Supply Industry	Financing limit (£ millions)	n.t	n.t	0	350	150	-75	-68	140	-165	-232	-312	-740	-1128	-1416	-1305	-1040
	Target return on assets (%)	7	10	n.t.	n.t.	n.t.	n.t.	n.t.	1.8	1.7	1.7	1.7	1.4	2.75	2.75	2.75	3.75

n.t. indicates that there was no target for that year
p indicates that the firm was privatized
Target return on assets is measured as the ratio of operating income after depreciation before interest and taxes. Measure is at historical cost prior to 1980 and at current cost post 1980.

Sources: HM Treasury, Financial Statement and Budget Report, Government Expenditure Plans (various issues), Company Annual Reports, National Ecoomic Development Office, A Study of UK Nationalised Industries: Background Paper1: Financial Analysis.

Table 4 - Descriptive Statistics of Variables

	# of obs	mean	s.d	min	max
State-owned firms					
One year ROA	866	0.18	0.46	-1.42	4.60
One year RONOA	886	0.07	0.10	-0.47	0.54
One year ROS	869	0.11	0.14	-0.83	0.55
One year Profits	889	122	343	-1667	2695
Change in ROA	833	0.02	0.11	-0.36	1.98
Change in RONOA	851	0.01	0.05	-0.24	0.42
Change in ROS	835	0.01	0.05	-0.65	0.41
Percentage Change in Profits	854	0.06	1.76	-15.09	23.78
Industry Change in ROA	822	0.009	0.04	-0.19	0.32
Industry Change in RONOA	848	0.006	0.03	-0.12	0.19
Industry Change in ROS	848	0.01	0.04	-0.37	0.20
Industry Percent Change in Profits	848	-0.04	4.04	-112.67	15.79
Executive Tenure	796	3.6	2.5	1.0	17.0
Executive Age	797	56.7	5.9	35.0	73.0
Privatized firms					
One year ROA	400	0.22	0.22	-0.19	1.65
One year RONOA	400	0.14	0.09	-0.10	0.50
One year ROS	402	0.17	0.12	-0.05	0.54
One year Profits	402	598	998	-351	5293
Change in ROA	400	0.01	0.07	-0.77	0.88
Change in RONOA	400	0.01	0.04	-0.34	0.27
Change in ROS	402	0.01	0.05	-0.59	0.27
Percentage Change in Profits	402	0.03	0.62	-7.65	4.72
Industry Change in ROA	404	0.014	0.04	-0.17	0.24
Industry Change in RONOA	404	0.009	0.02	-0.10	0.14
Industry Change in ROS	404	0.01	0.02	-0.05	0.16
Industry Percent Change in Profits	404	0.96	19.84	-36.52	396.97
Executive Tenure	407	4.6	3.3	1.0	14.0
Executive Age	401	56.7	6.8	40.0	74.0
Private firms					
One year ROA	1579	0.23	0.11	-0.02	0.81
One year RONOA	1579	0.15	0.07	-0.01	0.46
One year ROS	1579	0.08	0.04	-0.01	0.38
One year Profits	1579	185	379	-24	2761
Change in ROA	1546	0.01	0.04	-0.29	0.36
Change in RONOA	1546	0.01	0.03	-0.18	0.23
Change in ROS	1546	0.00	0.02	-0.12	0.14
Percentage Change in Profits	1546	0.07	0.40	-8.60	3.57
Industry Change in ROA	1545	0.013	0.09	-3.04	0.60
Industry Change in RONOA	1545	0.009	0.05	-1.79	0.26
Industry Change in ROS	1545	0.01	0.03	-0.85	0.13
Industry Percent Change in Profits	1545	0.08	0.49	-14.81	8.21
Executive Tenure	1411	5.3	4.6	0.0	32.0
Executive Age	1341	56.9	7.6	27.0	92.0

ROA defined as ratio of operating income before interest and taxes to net assets
RONOA defined as ratio of operating income before interest and taxes to net operating assets
ROS defined as ratio of operating income before interest and taxes to turnover
Industry defined as all firms in *Datastream* with the same *Financial Times* industry classification

Table 5 Executive Turnover in UK firms (1970-1995)

		probability of turnover by type of firm			
	# of obs.	nationalized	privatized	private	all firms
Panel A - Probability of Turnover					
Average (Chairman and second exec)	1798	14.5	13.6	10.7	12.0
Average (all executives)	2899	14.1	15	10.4	12
1970s	1046	13.8	n/a	10	11.6
1980s	1193	14	17.4	9.8	11.9
1990s	660	18.9	13.8	12.3	13
Implied tenure (1/turnover rate)		7.1	6.7	9.6	8.3
Panel B - Reasons for Turnover					
Quits		**72.0**	**41.0**	**68.3**	**64.8**
Ill health or death (WW,P)		3.7	3.7	4.8	1.6
Honorary board position and >59 (WW,P)		21.7	10.9	1.6	1.6
Promotion or lateral move (WW,P)		9.3	13.8	25.6	1.6
Announced retired and >61(P)		16.2	18.3	12.8	34.4
No new position and >61 (WW)		12.4	14.6	24.8	0.0
Unclear and >61 (WW,P)		5.0	3.4	2.4	1.6
Fires		**28.0**	**59.0**	**31.7**	**35.2**
Reported forced departure (P)		5.6	3.2	0.0	3.3
Reported board conflict (P)		11.8	10.0	1.6	23.0
Other board position and < 60		1.9	6.3	12.8	4.9
Lower position in other firm (WW)		0.0	0.9	0.0	4.9
Takeover/ split up induced change (P)		0.0	0.6	1.6	0.0
Announced retire but active (WW,P)		0.6	0.9	0.8	1.6
Reported retirement and <62 (P)		1.9	4.0	2.4	13.1
No new position and <62 (WW)		0.6	1.7	3.2	1.6
Unclear but < 62		6.2	4.0	2.4	1.6
		3.11	3.72	3.2	4.92
Number of turnovers		125	61	161	347

Turnover statistics for all Chairman, Deputy Chairman, CEO and Managing Directors.
WW indicates that primary source for this coding was Who's Who.
P indicates that primary source for this coding was on-line Finanical Times press reports.
To help code reasons for turnover we also used annual reports, books, and articles when available.

Table 6 - Multinomial Logit Models of CEO Turnover in Nationalized and Privatized Firms

	Coefs.	t-stats.	Coefs.	t-stats.	Coefs.	t-stats.	Coefs.	t-stats.
Fires	**Δ ROA**		**Δ RONOA**		**Δ ROS**		**% Δ Income**	
Nationalized firm performance measure	0.36	0.3	0.33	0.2	0.88	0.2	-0.09	-0.7
Privatized firm performance measure	-8.79	-2.2	-16.29	-2.4	-20.48	-3.2	-0.17	-0.6
Nationalized industry performance measure	0.73	0.2	1.89	0.3	2.02	0.3	0.06	0.3
Privatized industry performance measure	-4.92	-0.6	-11.56	-0.9	1.78	0.2	0.00	-0.1
Privatized firm	0.86	0.8	1.03	1.0	0.97	0.9	0.83	0.9
Nationalized CEO wage relative to other nationalized CEOs	0.00	-0.9	0.00	-0.8	0.00	-1.0	0.00	-1.0
Privatized CEO wage relative to other privatized CEOs	0.00	0.0	0.00	-0.1	0.00	0.2	0.00	0.3
Tenure in nationalized firm	0.25	2.1	0.25	2.1	0.32	2.8	0.29	2.7
Tenure in privatized firm	0.07	0.8	0.07	0.8	0.08	0.9	0.06	0.7
Age	-0.04	-1.0	-0.04	-1.0	-0.05	-1.1	-0.04	-0.9
Of retirement age (62 - 65 years)	-0.16	-0.2	-0.14	-0.2	-0.09	-0.1	-0.15	-0.2
Time Dummy -Thatcher era (1978-1989)	0.05	0.1	0.08	0.1	0.03	0.0	0.22	0.3
Time Dummy - After 1990	1.00	1.0	0.98	0.9	1.17	1.1	1.15	1.1
Firm in sector with a low level of competition	-1.30	-1.8	-1.32	-1.8	-1.41	-2.0	-1.26	-1.9
Firm in quasi-competitive sector	-0.04	-0.1	-0.01	0.0	-0.04	-0.1	0.01	0.0
Electricity generation firm	0.39	0.4	0.54	0.6	0.44	0.5	0.18	0.2
Water distribution firm	0.46	0.6	0.54	0.7	0.89	1.2	0.48	0.7
Constant	-1.68	-0.7	-1.63	-0.6	-1.76	-0.7	-2.26	-0.9
Quits								
Nationalized firm performance measure	1.55	1.8	1.98	1.0	2.78	1.3	0.01	0.1
Privatized firm performance measure	-6.27	-1.5	-14.74	-2.0	-16.88	-2.6	-0.99	-3.4
Nationalized industry performance measure	0.16	0.2	0.90	0.3	0.44	0.2	-0.01	-0.1
Privatized industry performance measure	-19.38	-2.1	-25.51	-1.8	-22.11	-1.4	-0.04	-0.3
Privatized firm	-2.83	-2.4	-2.90	-2.4	-2.82	-2.4	-3.68	-3.1
Nationalized CEO wage relative to other nationalized CEOs	0.00	-1.5	0.00	-1.3	0.00	-1.2	0.00	-1.3
Privatized CEO wage relative to other privatized CEOs	0.00	-0.9	0.00	-0.9	0.00	-1.1	0.00	-0.7
Tenure in nationalized firm	0.13	1.9	0.13	1.9	0.14	2.0	0.13	2.0
Tenure in privatized firm	0.39	3.5	0.40	3.7	0.40	3.7	0.40	3.9
Age	0.23	4.8	0.22	4.6	0.23	4.8	0.23	4.9
Of retirement age (62 - 65 years)	0.47	1.3	0.42	1.2	0.41	1.2	0.42	1.2
Time Dummy -Thatcher era (1978-1989)	-0.81	-1.7	-0.68	-1.5	-0.82	-1.8	-0.62	-1.4
Time Dummy - After 1990	-0.75	-1.0	-0.56	-0.8	-0.46	-0.6	-0.18	-0.3
Firm in sector with a low level of competition	0.34	0.6	0.46	0.9	0.50	0.9	0.51	1.0
Firm in quasi-competitive sector	-0.03	-0.1	0.00	0.0	0.10	0.2	0.04	0.1
Electricity generation firm	0.03	0.1	-0.02	0.0	0.02	0.0	-0.15	-0.3
Water Distribution firm	-0.42	-0.7	-0.48	-0.9	-0.17	-0.3	-0.50	-0.9
Constant	-16.16	-5.4	-15.40	-5.3	-16.16	-5.5	-16.14	-5.6
Number of observations	587		598		600		600	
Pseudo R-squared	0.23		0.22		0.23		0.20	

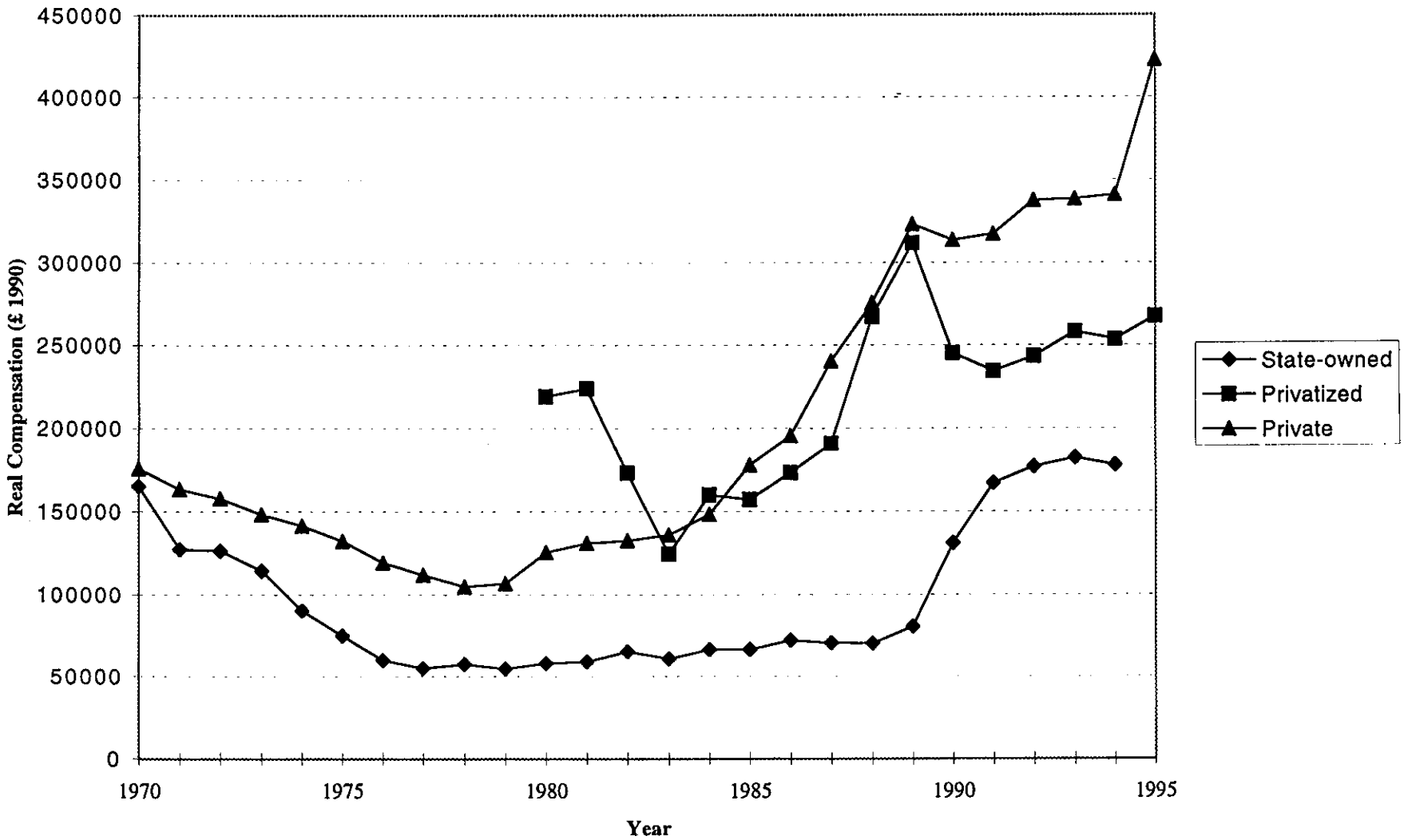
Table 7 - Simulated Sensitivity of Top Executive Turnover of UK firms (1970-1995)

	ROA	RONOA	ROS	ROA	RONOA	ROS
	Decrease in predicted fire rate when performance increases			Predicted fire probability at mean performance		
State-owned	-3%	-1%	-5%	3.0%	2.7%	2.5%
Privatized	67%	61%	80%	6.0%	6.4%	5.2%
Private post-1980	39%	45%	82%	4.6%	4.5%	4.2%
Private pre-1980	2%	1%	0%	4.8%	4.7%	5.0%
	Decrease in predicted quit rate when performance increases			Predicted quit probability at mean performance		
State-owned	-22%	-13%	-25%	11.5%	11.0%	9.9%
Privatized	51%	57%	72%	12.7%	11.5%	10.0%
Private post-1980	10%	0%	-9%	5.1%	5.2%	3.8%
Private pre-1980	-10%	-7%	-17%	5.2%	5.2%	3.9%

The percentage change is the difference in the predicted probability evaluated at the sample means with the performance measure one standard deviation below and above the mean divided by the predicted probability evaluated at the poor performance outcome..

Table 8 - Multinomial Logit Models of CEO Turnover in Private and Privatized Firms								
	Coefs.	t-stats.	Coefs.	t-stats.	Coefs.	t-stats.	Coefs.	t-stats.
Fires	Δ ROA		Δ RONOA		Δ ROS		% Δ Income	
Private firm performance measure after 1980	-3.62	-0.7	-8.86	-1.1	-19.95	-1.2	-1.32	-1.3
Private firm performance measure before 1980	-0.09	-0.6	-0.15	-0.7	0.05	0.1	-0.54	-1.5
Privatized firm performance measure	-9.58	-2.3	-17.02	-2.4	-23.73	-3.6	-0.19	-0.7
Private industry performance measure after 1980	4.49	0.7	11.50	1.3	15.17	1.0	0.50	2.6
Private industry performance measure before 1980	0.00	0.2	0.01	0.2	0.00	0.0	0.13	0.3
Privatized industry performance measure	-4.83	-0.6	-11.65	-0.9	0.72	0.1	0.00	-0.1
Privatized firm	0.30	0.4	0.42	0.6	0.18	0.2	0.15	0.2
Private CEO wage relative to other private CEOs	0.00	-1.7	0.00	-1.7	0.00	-1.6	0.00	-1.6
Privatized CEO wage relative to other privatized CEOs	0.00	0.0	0.00	0.0	0.00	0.3	0.00	0.4
Tenure in private firm	-0.01	-0.2	-0.01	-0.2	-0.01	-0.2	-0.02	-0.4
Tenure in privatized firm	0.07	0.8	0.07	0.8	0.07	0.8	0.06	0.7
Age	-0.04	-1.6	-0.04	-1.7	-0.04	-1.7	-0.04	-1.6
Of retirement age (62 - 65 years)	-0.90	-1.5	-0.88	-1.5	-0.82	-1.4	-0.80	-1.4
Time Dummy -Thatcher era (1978-1989)	-0.25	-0.5	-0.32	-0.6	-0.26	-0.5	-0.30	-0.6
Time Dummy - After 1990	0.47	1.0	0.45	0.9	0.45	1.0	0.36	0.8
Firm in sector with a low level of competition	-1.19	-1.1	-1.22	-1.1	-1.71	-1.6	-1.26	-1.2
Firm in quasi-competitive sector	0.00	0.0	-0.07	-0.1	-0.08	-0.1	0.00	0.0
Electricity generation firm	0.49	0.4	0.67	0.5	1.04	0.8	0.37	0.3
Water distribution firm	0.74	0.6	0.79	0.7	1.88	1.6	0.81	0.7
Constant	-0.75	-0.6	-0.69	-0.5	-0.62	-0.5	-0.67	-0.5
Quits								
Private firm performance measure after 1980	-0.91	-0.2	-0.36	0.0	0.04	0.0	0.16	0.3
Private firm performance measure before 1980	0.67	0.9	0.96	0.9	1.76	1.0	-0.01	0.0
Privatized firm performance measure	-7.75	-1.7	-17.03	-2.3	-20.30	-3.1	-1.05	-3.6
Private industry performance measure after 1980	0.85	0.2	1.47	0.2	1.96	0.2	-0.16	-0.3
Private industry performance measure before 1980	0.01	0.1	0.00	0.1	-0.01	-0.2	-0.02	-0.1
Privatized industry performance measure	-23.05	-2.3	-33.66	-2.3	-47.64	-2.5	-0.05	-0.4
Privatized firm	-2.64	-2.3	-2.76	-2.4	-2.64	-2.3	-3.12	-2.8
Private CEO wage relative to other private CEOs	0.00	-1.7	0.00	-1.7	0.00	-1.8	0.00	-1.6
Privatized CEO wage relative to other privatized CEOs	0.00	0.2	0.00	0.2	0.00	0.6	0.00	0.1
Tenure in private firm	0.07	2.4	0.07	2.3	0.07	2.3	0.06	2.1
Tenure in privatized firm	0.43	3.4	0.45	3.6	0.45	3.6	0.41	3.7
Age	0.17	5.9	0.17	5.9	0.17	6.0	0.18	6.1
Of retirement age (62 - 65 years)	0.80	3.0	0.81	3.1	0.80	3.0	0.78	2.9
Time Dummy -Thatcher era (1978-1989)	-0.23	-0.6	-0.26	-0.7	-0.25	-0.7	-0.19	-0.6
Time Dummy - After 1990	-0.55	-1.4	-0.52	-1.4	-0.54	-1.4	-0.37	-1.0
Firm in sector with a low level of competition	0.79	0.9	0.80	0.9	0.74	0.9	0.84	1.0
Firm in quasi-competitive sector	-0.89	-0.8	-1.19	-1.0	-1.15	-1.0	-0.41	-0.4
Electricity generation firm	-0.23	-0.2	-0.13	-0.1	0.36	0.3	-0.59	-0.5
Water distribution firm	-0.20	-0.2	-0.18	-0.2	2.14	1.7	-0.13	-0.1
Constant	-13.34	-7.2	-13.45	-7.3	-13.58	-7.3	-13.91	-7.4
Number of observations	1136		1136		1136		1136	
Pseudo R-squared	0.18		0.18		0.19		0.17	

Figure 1 Real Mean Compensation Levels in UK Firms



Results presented use the expansive top managers definition of management. The number of managers included varies significantly by year. Results for privatized firms prior to 1983, and for state-owned firms after 1990, are based on very few observations.