Changes in Share Ownership and Corporate Monitoring

Abstract

We document a significant decrease in the ownership structure of a large number of companies in the UK over the last decade. We find that the increase in firm's size and risk and the decrease in performance explain a large proportion of this change. We also find that the dilution of ownership through new issues rather than sales of stakes to be the main reason for the decrease in management ownership and the holdings of pressure-resistant investors, such as fund managers and pension funds. Finally, we report that, although the fundamental determinants of ownership structure have not shifted in the 1990s, the relationship between firm value and ownership structure became weak or negative in the late 1990s.

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1. Introduction

Share ownership by institutional investors has been in the centre of much debate, criticism and reviews. In theory, block ownership by institutional investors should prevent managers from pursuing their own interest at the expense of those of shareholders.[1] This divergence of interest between managers and shareholders, referred to in the literature as the agency conflict, cannot be totally resolved by the market for corporate control (Jensen 1993), legal rules (e.g., Shleifer and Vishny, 1997) or by managerial holding (e.g., McConnell and Servaes, 1990, 1995).[2] Instead, block ownership by institutional investors (alone or in a combination with alternative mechanisms) is likely to be the solution to these agency problems because of economies of scales, diversification, gains from monitoring and relevance of resources invested (e.g., Diamond, 1984, Admati, Pfleiderer and Zechner, 1994, Maug, 1998, and Agrawal and Knoeber, 1996). However, if the monitoring costs are higher than the potential benefits, then institutional investors will not monitor and managers will be likely to pursue their own interests at the expense of those of shareholders.

The empirical evidence provided to date on the effectiveness and efficiency of the monitoring role of blockholders is mixed. In a recent extensive survey on blockholders and corporate control, Holderness (2003) addresses four main questions dealt with in the previous literature (i) how prevalent are blockholders, (ii) what motivates block ownership, (iii) what impact have block ownership on certain major firm's decisions, and, (iv) what impact do blockholders have on firm value. He shows that, on average, blockholders own about 20% of US equities, they have both the shared benefit of control (i.e., the incentives and the opportunity to increase a firm's expected cash flows that accrue to all shareholders) and the private benefit of control (i.e., the incentive and the opportunity to consume corporate benefits to the exclusion of atomistic shareholders), they hardly affect firm's major decisions and firm value. These puzzling results call for further investigation on the relationship between block ownership and corporate control.

The purpose of this paper is to extend this string of research by analyzing the monitoring role of each category of large investor in the UK. We identify separately the categories of blockholders reported in the financial statements of each company in

the sample. These include insiders, fund managers, pension funds, banks, insurance companies, overseas investors, public companies, individuals and nominees. We classify these into four main categories: (i) Insiders, (ii) minority shareholders which include overseas investors, public companies, individuals and nominees, and we follow Brickley, Lease and Smith (1988, 1994) in classifying the remaining shareholders into (iii) pressure-resistant investors, and, (iv) pressure-sensitive shareholders. The former include fund managers and pension funds. The latter include any shareholder category such as banks and insurance companies, with potential commercial link with the company. We then analyse the determinants of the changes in ownership structure over the last decade and test the contractual hypothesis under which companies adopt an optimal ownership structure to minimize their potential agency costs.

We use a sample of 764 companies for which ownership and financial data is available over the whole 1993 and 1998 period. We find a significant drop in the proportion of shares and value of holdings by all shareholder categories over these two sample periods. We show that the median managerial ownership has decreased from 6.7 per cent to 3.6 per cent. At the same time we report a decrease from 9.2 per cent to 7.8 per cent in the holdings of pressure-resistant investors, 7.3 per cent to 6.2 per cent for pressure-sensitive investors and from 5.1 per cent to 4.2 per cent for the remaining shareholders.

We then attempt to explain the rationale behind this change. We find that the fundamental determinants of ownership structure have not changed. In both 1993 and 1998 periods, ownership structure can be explained by proxy variables that measure size, scope for discretionary spending and risk aversion. We also find a negative relationship between the ownership variables themselves, implying that in companies where, for example, pressure-resistant investors hold large stakes, managerial holding is low. These results suggest that companies adopt an optimal ownership structure that minimises agency conflict. The actual changes in holdings are negatively related to change in firm's size, risk and ownership of other categories of investors but positively related to firm performance. However, we report that the relationship between ownership structure and firm value has shifted significantly in the last decade. In particular, while the relationship between firm value and managerial

ownership is strong and inverse-curve-linear in 1993; it became weak or negative in the late 1990s. We also do not report monitoring role for pressure-resistant and pressure-sensitive investors. The relationship between firm value and these holdings is weak or negative. Consistent with Faccio and Lasfer (2000a), our results cast doubt on the monitoring role of large investors in the UK in the late 1990s despite the policy-makers' recommendations.

The rest of the paper is structured as follows. Section 2 deals with the review of the literature on shareholder monitoring, corporate governance and UK institutional framework. In Section 3 we present the data and the methodology. Section 4 presents the results and Section 5 the conclusions.

2. Theoretical framework

In this section we review the literature on corporate governance, describe the potential monitoring role of the largest shareholders in the UK and set up our hypotheses.

2.1. Shareholder Monitoring and Activism

A number of theoretical studies provide a framework to explain the context in which large investors would be motivated to monitor managers.[3] Diamond (1984) developed a model in which monitoring costs explain large intermediary's choice to monitor, refrain from monitoring or to delegate monitoring. The model predicts that as the size of the intermediary increases, the delegation costs and the duplications in monitoring activities decrease. In this model, large intermediary is expected to monitor because of economies of scale and diversification. However, this model has been criticised for using banking intermediation synonymously with financial intermediation. Also, the conditions under which monitoring will take place and the level of the commitment to monitoring is not explained in this model.

Admati *et al* (1994), on the other hand, provide insights into the large investors' incentives to monitor. The model adopts a 3-period time structure. It assumes that there is one large investor, namely the price-maker, who holds a significant stake in the firm and can choose the level of monitoring, has access to costly monitoring technology which in turn affects the expected payoffs and can

influence share price. They argue that when monitoring is costly, intermediary will only monitor when a modification in the firm payoff structure and a net benefit is expected. Shleifer and Vishny (1997) and Agrawal and Knoeber (1996) suggest that large investors, because of the relevance of the resources invested, have all the interest and the power to monitor companies.

Maug (1998) analyses the incentives of large shareholders to monitor public corporations in a liquid markets context. He suggests that while liquid markets reduce large shareholders' incentive to monitor because they can sell their holdings easily, such markets make corporate governance more effective as it is cheaper and easier to acquire and hold large stakes. Kahn and Winton (1998) develop a model in which they distinguish between liquidity, speculation and intervention. They argue that intervention is a function of the size of the institution's stake, firm specific factors and institution's trading profit.

Policy-makers also rely on large shareholders to monitor companies. For example, in the UK, large investors, which are mainly institutional investors, are perceived as carrying a social responsibility of promoting good corporate governance in companies in which they hold shares (Cadbury, 1992). By virtue of their size, they are thought of as equipped with the power to govern by exercising their voting rights.

However, these theories assume that shareholders are one large, homogenous and rational group. Large investors can be individuals or institutions, are likely to face different monitoring costs and benefits and could themselves suffer from agency conflicts (e.g., Del Guercio and Hawkins, 1999). Individual investors are less likely to own large stakes because of the constraints in their wealth and personal borrowing, and the low portfolio diversification that this would imply (e.g., Demsetz and Lehn, 1985). Even when individuals are the large shareholders, they behave differently from institutions in sponsoring initiatives (e.g., Jarrell and Poulsen, 1987, Karpoff *et al*, 1996). Institutional investors vary greatly in size and in purpose, with different sets of obligations and pressures in place for each type (Charkham, 1995). Brickley, Lease and Smith (1988) and Gordon and Pound (1993) note that institutional behaviour is not homogeneous as it depends on the sensitivity to managerial pressure. Accordingly, Brickley *et al* (1988) classify institutions into two groups as "pressure-resistant" and "pressure-sensitive" institutions. Pressure-resistant institutions are less subject to

management influence and more likely to oppose managers. They suggest that typical examples of such institutions are mutual funds, foundations and public employer pension funds. Pressure-sensitive institutions, on the other hand, have a current or potential business with the firm and are sensitive to pressures from the management to vote in their favour. Typical examples of such institutions are banks, insurance companies and trusts. Pound (1988) also suggests that the extent of the institution's intervention is dependent on the relationship between the institution and the company. He shows that, in most cases, institutions tend to vote in favour of management. Under the UK institutional framework, Short and Keasey (1997) report an institutional network with club-like dynamics in operation and Gaved (1996) suggests that the high ownership concentration[4] lead to a more *relationship investing* approach characterised by reduced emphasis on financial history and higher emphasis on intangibles.

Hoskisson et al. (1995) focus on certain types of institutional investors in the US and point to the variations in the objectives of mutual funds versus pension funds. Coffee (1991) puts forward the notion of the *optimal corporate monitor* and comments that pension funds are more likely to fulfil the requirements of this role than other institutions. However, there are drawbacks to the argument especially regarding externally managed pension funds and large pension funds with highly diversified portfolios composed of relatively small holdings per se, both of which serve to limit the monitoring activity.

The empirical evidence provided to date on the monitoring role of the large shareholders is mixed. A number of studies show that large shareholders act as effective monitors in top management turnover (e.g., Franks and Mayer, 1994; Kang and Shivdasani, 1995; Kaplan and Minton, 1994), in takeovers (Agrawal and Mandelker, 1990; Shleifer and Vishny, 1986; Sudarsanam, 1996) and in certification for initial public offerings (Lin, 1996). Short and Keasey (1997) report the presence of institutional investors to have a positive effect on corporate performance and Chaganti and Damanpur (1991) find that institutional ownership has a significantly positive effect on return on equity (ROE). Other studies report that block purchases by large shareholders are typically followed by an increase in value, in top management turnover, in financial performance and in asset sales (e.g., Bethel *et al.*, 1998; Mikkelson and Ruback, 1985; Shome and Singh, 1995). However, Demsetz and Lehn

(1985) find no cross-sectional relationship between large shareholding and the accounting rates of return. Holderness and Sheehan (1988), Murali and Welch (1989) and Denis and Denis (1994) find no evidence to suggest that institutional ownership affects firm performance. Agrawal and Knoeber (1996) show that the relationship between blockholding and corporate performance as measured by Tobin's Q is weak[5]. Karpoff, Malatesta and Walkling (1996) do not find evidence that shareholder proposals increase firm value or influence firm policies. Duggal and Miller (1999) report that active institutional investors do not increase efficiency in the market for corporate control. Faccio and Lasfer (2000a) show that pension funds, the largest shareholder category in the UK, do not add value, and do not lead companies in which they hold large stakes to outperform their industry counterparts or to comply with the *Code of Best Practice*, i.e., to have more non-executive directors on the board and to split the roles of chairman and chief executive officer.

A number of studies analyse the combination of large shareholding with alternative mechanisms used to reduce agency conflicts.[6] For example, McConnell and Servaes (1990) report a significant relationship between performance and the combination of large shareholders and director ownership. However, Agrawal and Knoeber (1996) show that large shareholdings have no statistically significant effect on firm performance when all the control mechanisms are incorporated into the analysis.

In terms of shareholder activism, various studies focused on resolutions submitted mainly by public pension funds. These can be classified into confrontational and non-confrontational strategies. Studies that analyse non-confrontational pension funds targeting strategies report positive abnormal returns when resolutions are successful (e.g., Smith, 1996, Carleton, Nelson and Weisbach, 1998, Gillan, Kensinger and Martin, 1999). However, the long-term effect on operating performance is negligible. On the other hand, other studies that centered on confrontational strategies do not offer any conclusive evidence that proposal submissions affect returns and performance (Wahal, 1996, Gillan and Starks, 2000 and Del Guercio and Hawkins, 1999). Strickland *et al.*, (1996) analyse the role of other types of investors and report evidence that targeting enhances firm value.[7]

2.2. Large shareholder monitoring in the UK

As in the US, the UK governance system is market-based characterized by liquid markets and unconcentrated company ownership, compared to the relationship-based systems of Japan and Germany where ownership is concentrated and markets are relatively illiquid.[8] However, there are a number of differences between the US and the UK institutional systems. Unlike the US where individuals are the largest investor category (e.g., Brankato, 1997), in the UK most shares are owned by financial institutions. According to the London Stock Exchange (1995), financial institutions held 60 per cent of UK equities in 1994 compared to 20 per cent for individuals.[9] In contrast, in the US, individuals held 50% in 1990 followed by pension funds with 20.1%, increasing to 25.4% in 1995 (Prowse, 1994; Brankato, 1997). The UK financial institutions are also highly concentrated and they invest most of their assets in equities (e.g., Faccio and Lasfer, 2000a). However, despite their size and holdings, UK financial institutions do not target companies and they rarely caste their vote at the annual general meetings (e.g., Mallin, 1997).

However, more recently, many institutions are raising their concerns and the National Association of Pension Funds (NAPF, 1996), has produced monitoring guidelines. The targets are mainly old economy companies that underperformed significantly over the last few years. The Financial Times (2000) reviewed the recent shareholder activism in the UK and suggested that:

"The slump in investor sentiment towards old economy companies is helping to spark a flurry of activism from institutional shareholders usually renowned for their passivity"

The passivity of institutional investors in the UK does not mean that UK companies are free form agency costs problems. Previous studies show that UK companies suffer from the same agency costs as their US counterparts (e.g., Lasfer, 1997). In addition, the recent concerns about the way in which remuneration packages for senior executives have been determined, the spectacular collapse of a number of large companies and the fraudulent use of the pension fund of Mirror Group Newspapers to finance an illegal scheme for supporting the share price of Maxwell Communications Corporation highlighted instances where directors do not act in the best interest of shareholders. However, institutional investors do not monitor because

the resources and time required to interfere with management decision-making are considerable and they become active only in the event of a real disaster (Financial Times, 2000).

2.3 Hypotheses tested

As in Brickley, Lease and Smith (1988) and Jarrell and Poulsen (1987), we test the hypothesis that firms with high institutional ownership are more likely to adopt value-increasing policies. As in Demsetz and Lehn (1985) and Himmelberg *et al* (1999), we test for the optimal ownership structure under a contracting environment faced by the firm. We also extend this trend of research by analysing the relationship between institutional ownership, managerial ownership and firm value. Following Brickley *et al* (1988, 1994), we split shareholders, excluding managerial ownership which we identify separately, into pressure-resistant, pressure-sensitive and other investors. The former category includes the holdings by investors that are not likely to have any commercial relationship with the firm. These include fund managers, investment trusts, unit trusts and pension funds (excluding pension funds investing in their own company). These investors are expected to monitor actively companies in which they hold large stakes because of their size, objectives and investment styles. Failure to monitor will indicate that these investors are passive or are subject to agency costs themselves (e.g., Del Guercio and Hawkins, 1999).

On the other hand, pressure-sensitive investors, i.e., investors with current or potential business relationship with the firm, are not likely to monitor because of the potential loss of commercial links with the firms. The remaining investors, such as overseas investors, nominees, individuals and public sector, are not expected to monitor because they are likely to be small and any monitoring activity will be costly and ineffective. Therefore, we test the hypotheses that these different investors are not homogeneous in their monitoring activities.

From a firm's perspective, we expect ownership structure to be optimal and to be determined in such a way as to minimise monitoring costs. Thus, for example, we expect managerial holding to be negatively related to the holdings of pressure-resistant investors, bondholder monitoring and scope for managerial discretionary spending. We account for liquidity that could also result in a negative relationship between managerial holding and blockholding.

As in McConnell and Servaes (1995) and Holderness, Kozner and Sheehan (1999), we test our hypotheses over two sample periods. However, unlike Holderness *et al* (1999) we do not focus only on the determinants of managerial ownership. We analyse the changes in the determinants of ownership structure between the two periods and the relationship between ownership structure and firm value. We also analyse changes in the firm's ownership structure and test for the hypothesis that such movements are determined by changes in the firm's contractual environment variables.

3. Data and Methodology

The sample consists of all non-financial companies listed in the London Stock Exchange in 1993 and in 1998. We started with 1360 UK non-financial companies. We exclude all companies with missing ownership and other data in 1993 and 1998. Our final sample includes 764 non-financial companies. We collect for each individual company manually ownership data from the London Stock Exchange Official Yearbook (the Yearbook),[10] and financial data from *Extel Financial* a database that reports all accounting and stock market data. The Yearbook provides the name of the shareholder and the shares held as a percentage of the ordinary capital of the company.[11] From June 1990, companies are legally required to disclose external interests equal to or greater than 3 per cent of their issued share capital. These relatively large holdings allow us to test directly the arguments of Admati *et al* (1994) and Diamond (1984) that the benefits of monitoring outweigh the costs.

The 1993-1998 period allows us to analyse the extent to which institutional monitoring has shifted over the last decade. In particular, the 1993 period marks the beginning of the increased emphasis on corporate governance issues with reports prepared by special task groups such as the Cadbury, Greenbury, Myners and Hampel Committees. Cadbury (1992) has specifically stressed the importance of financial institutions to encourage companies to adopt a more efficient corporate governance system, as contained in the *Code of Best Practice.* The report specifies that institutional investors are expected to make greater use of their voting rights, to seek contacts with companies at a senior executive level, to monitor the board and to bring about changes in under-performing companies rather than dispose of their shares. In

this paper we concentrate on the changes in the relationship between ownership and firm value over these two periods to see whether such recommendations are followed.

We define a number of observable variables that influence the optimal ownership structure. We extend the specifications used in previous studies (e.g., Demsetz and Lehn, 1985, Himmelberg *et al*, 1999) by including various explanatory variables to proxy for the scope of managerial discretion, the monitoring role of each type of blockholders, and to account for the UK institutional framework. Table 1 lists the variables, including those used only for robustness checks.

Ownership Structure: We define management ownership as the proportion of shares held by firm's managers that are members of the board. UK quoted companies are required to disclose in their financial statements the names of all the board members, and the proportion of shares held directly and indirectly (beneficial and non-beneficial) by executive and non-executive directors, even if the ownership stake is zero (Companies Act 1985). The officers who are not members of the board are only subject to the ordinary disclosure rules of 3% or above. This legal disclosure requirement meant that we had to define managerial ownership as ownership by members of the board of directors. Although this definition is consistent with that of Morck *et al* (1988) and Short and Keasey (1999), it differs from that of McConnell and Servaes (1990) and Holderness *et al* (1999) as we do not include shares owned by corporate officers not members of the board. We tried to split managerial ownership variable into ownership of executive and non-executive directors. We find that non-executive directors' ownership is very small (less than 1%). We assume that the inclusion of this holding is not going to affect our analysis. The holdings of executive non-members of the board and employees are included in pressure-sensitive category.

We collect all other holdings above 3 per cent and classify them first into type of investor.[12] Each type of investor is then classified into pressure-resistant, pressure-sensitive and other. Appendix A1 provides the list of each type of investors.

Performance measures: We use four measures of performance, Tobin's Q, market-to-turnover, return on assets and one-year abnormal returns. As in previous studies (e.g., Himmelberg *et al*, 1999), we define Tobin's Q as the sum of the market value of equity and book value of debt over total assets. We test for the robustness of these results by using market value of equity *plus* total liabilities *over* total assets,

market-to-book and one-year raw returns. The results are qualitatively similar.

Size: Firm size has also an ambiguous effect on the scope for managerial entrenchment and the monitoring role of investors. Jensen (1986) argues that larger companies are more likely to suffer from agency costs, which, in turn increases the desire for larger managerial ownership. However, because of the wealth constraint problem, managers cannot hold large stakes in large firms. In addition, as argued by Himmelberg et al (1999), large firms might enjoy economies of scale in monitoring by top management and by rating agencies, leading to a lower managerial ownership. We use the log of firm market value, ln(mv), to measure size. We test for robustness of our results by using total assets and sales revenue.

Shareholders' risk aversion: Himmelberg *et al* (1999) argue that, since higher managerial ownership imply less portfolio diversification for managers, the optimal contract involves a trade off between diversification and incentive performance. They suggest a negative relationship between the firm's idiosyncratic risk and optimal managerial ownership. Other investors, on the other hand, are not likely to face similar wealth-constraint than managers. For example, fund managers allocate their assets in such a way as their risk is diversified. Thus, for pressure-resistant or pressure-sensitive investors, the negative relationship between their holdings and the firm's risk profile is not likely to prevail. We use the standard deviation of 5-year monthly stock returns (*Sigma*) and the regression coefficient of 5-year stock return on the market index (*beta*) as proxy for volatility. As in Himmelberg *et al* (1999), we set missing value of *Sigma* (4 per cent of observations) equal to zero to maintain our sample size and include in the regressions a dummy variable *DSigma* equal to one when Sigma is not missing and zero otherwise.

Scope for discretionary spending: Following Himmelberg *et al* (1999), we use the ratio of firm's tangible fixed assets-to-sales to measure the extent to which firms that have more observable fixed investment have lower agency costs because these investments are easy to monitor. We expect the higher the proportion of these investments, the lower the managerial ownership and the lower propensity of other categories of investors to monitor.

Himmelberg *et al* (1999) also argue that there is a need to control for other firm's expenditures, which are discretionary, and less easily monitored. As in their

study, we define the ratio of R&D over tangible fixed assets, R&D/K, we set missing values into 0 and construct a dummy variable, RDum, equal to one if the firm reports R&D spending, zero otherwise. We account for growth opportunities by using the firm's investment rate, the ratio of investments in tangible fixed assets over tangible fixed assets and we use the ratio of operating income to sales to measure the level of free-cash flow.

In addition to these variables we account for the power of shareholders and bondholders in reducing scope for discretionary spending by including measures of dividend payments and leverage. We use dividend yield, the ratio of dividend over year-end share price. We test for the robustness of these results by using the payout ratio. We expect a negative relationship between yield and managerial ownership if managerial holding reduces the free cash flow problem. Similarly, the level of monitoring by say, pressure-resistant investors is likely to be reduced if the firm is already paying high dividends.

The impact of leverage on the scope for moral hazard is ambiguous. Harris and Raviv (1988) and Stulz (1988) argue that managers may tend to increase leverage in order to inflate the voting power of their shareholdings, and reduce the discipline of the market for corporate control. In contrast, Fama (1980) and Jensen (1986) argue that, since managers may tend to protect their under-diversified wealth, including human capital and reduce the pressures to pay out a large amount of cash, they may limit the use of debt. We define Lev as the ratio of total debt over the sum of total debt and market value of equity. We test for the robustness of these results by using the book value of leverage, defined as the ratio of total debt over the sum of total debt and book value of equity to assess the monitoring role of debt holders.

We lag our control variables to account for endogeneity between firm value and managerial ownership (Palia and Lichtenberg, 1999). In addition, to avoid that our results reflect a spurious relationship between ownership and performance, we include industry dummies to control for unobservable firm characteristics.

[Insert Table 1 here]

4. Empirical Results

4.1. Changes in Ownership Structure

Table 2 presents the descriptive statistics of the ownership structure variables

over the sample periods. Table 2, Panel A, reports the proportion of shares owned by each category of investors. As expected, financial companies own the largest proportion of shares in our sample companies. However, the striking results are the changes from 1993 to 1998. The results indicate a significant decrease in share ownership in the late 1990s for all shareholder categories. For example, while managerial holdings amount to 16 per cent in 1993, they decreased to 13 per cent in 1998. To account for non-linearity in the holdings, we report also the median values. The median managerial ownership decreased from 6.7 per cent to 3.6 per cent. The differences in means and in medians are all statistically significant, as reported in the last column of Table 2. The only exception relates to financial companies. Their average holdings decreased from 22.1 per cent to 21.4 per cent but the differences in means and medians are not statistically significant. (Appendix A1 reports the detailed results of the changes in the ownership levels of each type of investor)

Table 2, Panel B, reports the pound value of ownership. As in Holderness *et al* (1999), we compute the £-value of ownership by multiplying the year-end market value of equity by the proportion of shares held by each category of investors but inflate the 1993 figures using the consumer price index to get the ownership value in real terms. The results show a significant decrease in the value of ownership in 1998. For example, the median value of managerial ownership amounts to £1.5m in 1993 compared to £0.6m in 1998. The difference in medians between the two sample periods is statistically significant. All the remaining differences in medians are significant, suggesting that the levels of ownership decreased in the late 1990s.

[Insert Table 2 here]

Why did companies change their ownership structure? Are these changes driven by changes in the fundamental determinants of ownership structure? Have companies moved into a more appropriate optimal level of ownership structure in the late 1990s? In the remaining sections we investigate reasons for these observed changes in ownership structures of our sample firms. We contrast the determinants of ownership structures over the two sample periods. We then analyse the relationship between ownership structure and firm value in both periods. Finally, we relate changes in ownership structure to changes in the explanatory variables to see whether these changes are consistent with the firm's changes in the contracting variables.

4.2 Financial Characteristics of our Sample Firms

Table 3 reports the descriptive statistics for the financial variables. In Panel A we report the 1993 values and in Panel B the 1998 values. We use two measures of size. In terms of market value, the average size of our sample firms in 1993 is £531m compared to £1,084m in 1998. The results indicate that our sample includes in both sample periods small (less than £1m) and large companies (more than £144bn in 1998).[13] The difference in means between the two periods is significant (t =-2.11) indicating that, on average, the size of our companies in 1998 is higher than that of 1993. However, the difference in medians is not statically significant and, when we use total assets as a proxy for size, the difference in means is also not significant, suggesting that our sample firms did not increase in size over the two sample periods.

The two measures of debts both indicate that our sample firms have increased their debt financing over the two sample periods. The average total debt (long-term and short-term) in 1998 amounts to £220m compared to £131m in 1993. The differences in means and in medians of both measures between the two sample periods are statistically significant.

The next 4 rows report the descriptive statistics of the performance measures. All these measures indicate a statistically significant decrease in the performance of our sample firms in 1998. For example, in 1993 the average abnormal returns amount to 8.74 per cent. In 1998, the average decreased to –22.7 per cent. The t-statistics of the differences in means of 15.22 is statistically significant at the 0.01 level.

The next two rows report the levels of risk of our sample firms. In 1993 our sample firms had a sigma of 34 per cent and a beta of 0.85. In 1998 sigma increased to 39.2 per cent and beta to 0.86. The differences in means and median sigma are statistically significant (t = 5.10). While the t-statistics of the difference in mean beta is not statistically significant (t = 1.10), the difference in median is statistically significant at 0.05 level. Thus the results indicate that, over the sample period, the risk of our companies has increased significantly.

The next 6 rows report the levels of our proxy variables for the scope for discretionary spending. The relative R&D expenditure amounts to 6.6 per cent in 1993 but decreased to 4.4 per cent in 1998. However, the differences in means and median

are not statistically significant. In contrast, the drop in the investment rate, *I/K*, from 25 per cent in 1993 to 21 per cent in 1998 is statistically significant (t = 4.25 and *Mann Whitney-p* = 0.00). Although the 'hard' capital ratio, *K/S*, and the free cash flow measure, *Y/S,* have increased in 1998, the differences in means and medians between the two periods are not statistically significant.

The last two measures of the firm's scope for discretionary spending, *yield* and *leverage*, have increased substantially over the two sample periods. For example, dividend yield increased from 2.7 per cent in 1993 to 3.9 per cent. The t-statistics of the differences in means and medians are significant at the 0.01 level (t = -10.22 and *Mann Whitney-p* = 0.00). Similarly, leverage increased significantly from 10.6 per cent in 1993 to 16.7 per cent in 1998 (t = -4.29 and *Mann Whitney-p* = 0.00).

These results could indicate that the drop in ownership is related to the changes in the firm's contractual fundamentals. For example, in 1998 companies in the sample became less profitable, more risky, more debt-financed and pay higher dividends than in 1993, leading to the drop in managerial ownership. In the next section we explore this issue further by analysing the extent to which the determinants of ownership structure remained the same over the two periods.

[Insert Table 3 here]

4.3 Determinants of Ownership Structure

Table 4 provides the size characteristics of our companies in 1993 and 1998 sorted by ownership bands. The first column of Panel A shows that managers hold shares in 61 per cent of companies. The median size of these companies as measured by market value of equity is £29m. In contrast, the median size of the 39 per cent of companies in which they don't hold shares is £212m. The difference in medians between the two samples is statistically significant; suggesting that managers, because of their wealth constraint, hold stakes is small companies. In contrast, companies in which the pressure-resistant and the pressure-sensitive investors hold large stakes are not small (column 3 to 6). The differences in the medians between the size of the companies in which these investors hold stakes and the remaining companies in which they don't hold stakes are not statistically significant. Finally, the last two columns of Table 4 indicate that the *other* investors hold stakes in small companies. The same

results appear in Panel B with the exception of the pressure-resistant shareholders that hold shares in smaller companies in 1998. The last row of Table 4 indicates that the differences in size of companies in which all the categories of investors hold stakes between 1993 and 1998 are not statistically significant.

[Insert Table 4 here]

As in Demsetz and Lehn (1995) and Himmelberg *et al* (1999), we transform each ownership variables into *ln(Ownership/(1-Ownership))* and refer to this variable as *ln(O/(1-O)*. Table 5 provides the correlation matrix between the variables used. The results indicate a strong and negative relationship between managerial holdings and holdings of other shareholder categories, firm size, leverage and yield. However managerial holding is positively correlated with the risk measure sigma and measure of scope for discretionary spending, *RD/K* and free cash flow, *I/K*. The table also indicates a strong correlation between the holdings of the pressure-sensitive investors and the holdings of the *other* category of investors. In general the correlation results in 1993 are similar to those in 1998 (Panel B).

[Insert Table 5 here]

Table 6 reports the regression results of the determinants of ownership structure in 1993 and 1998. The first column indicates a strong and negative relationship between managerial ownership and pressure-resistant, pressure-sensitive, other investors, firm size and sigma. In 1998, managerial ownership is also negatively related to pressure-resistant, pressure-sensitive, other investors, firm size but sigma is not significant and the utilities dummy is negative and significant.

The next two columns of Table 6 report the determinants of pressure-resistant investors. The holdings of pressure-resistant shareholders are negatively related to the holdings of managers, pressure-sensitive and other investors, firm size, tangible assets over sales, R&D dummy and yield. However, they are positively related to growth opportunities, *I/K*. In 1998, tangible assets over sales and R&D dummy no longer explain the holdings of pressure-resistant investors. The next two columns report the determinants of the holdings of pressure-sensitive investors. As for the previous two ownership categories, the holdings of pressure-sensitive investors is negatively related to the holdings of managers, pressure-resistant investors, firm size and R&D dummy but positively related to the holdings of the *other* category of investors. Finally, the

last column reports the holding of *Other* investors. The results indicate a strong negative relationship between their holdings and that of managers, pressure-resistant investors, firm size, R&D dummy and yield but positive relationship with the holdings of pressure-sensitive investors.

In general, the results indicate that the determinants of the optimal ownership structure of our firms have not changed significantly over the two sample periods. The ownership groups are mutually exclusive (with the exception of pressure-sensitive and *Other* category). All investors appear to hold stakes in small companies and the risk element is only observed for the case of managerial ownership.

[Insert Table 6 here]

4.4 Ownership structure and firm value

Table 7 reports the correlation matrix between various measures of firm's performance and ownership structure. Panel A is based on 1993 data. The results show a strong and positive relationship between managerial holdings and various measures of firm performance such as Tobin's Q, market-to-book and abnormal returns. The results indicate that, on average companies in which managers hold large stakes in 1993 perform better than other companies. The next column reports a negative relationship between pressure-resistant holding and firm value. Although most of the correlation coefficients are not significant, the results indicate that pressure-resistant shareholders invest in low performing companies. Similarly, pressure-sensitive investors appear to target low performing companies in 1993. The last column indicates that *Other* shareholders invest in companies that generate high abnormal returns in 1993.

Panel B reports the results based on 1998 data. The results show a significant shift in the performance of companies in which managers hold large stakes. These companies underperformed substantially. Companies in which pressure-resistant investors invested have also underperformed. The last column indicates a positive relationship between the ownership of *Other* investors and market-to-book and market-to-sales.

[Insert Table 7 here]

Table 8 reports the results of regressions between firm value as measured by

Tobin's Q and ownership structure. In Equations (1), we report the direct relationship between firm value and level of ownership. In Equations (2) we account for other potential explanatory variables. The first column indicates that the relationship between firm value and managerial ownership is strong but non-linear. Even when we introduce other explanatory variables, the coefficients of both measures of managerial ownership are significant. The results suggest that in 1993, the relationship between firm value and managerial ownership is curve-linear, increasing up to managerial ownership of 27 per cent and then decreasing. The results based on the 1998 data (columns 3 and 4) show, however, that the relationship between managerial ownership and firm value disappeared. In both Equations (1) and (2), the coefficients of managerial ownership are not significant. When we regressed Q against managerial ownership alone, we find a coefficient of –0.61 (t = -2.43), indicating that managerial ownership destroys value.

The next four columns report a negative relationship between firm value and the holdings of pressure-resistant investors. The results indicate that companies in which pressure-resistant investors hold large stakes underperform, in particular in 1998. The results also imply that the pressure-resistant shareholders do not monitor companies in which they hold large stakes. Given that this category of investors includes pension funds, the results are consistent with Faccio and Lasfer (2000a) who show that pension funds in the UK are not effective monitors. The last 8 columns show that, in general the relationship between firm value and pressure-sensitive investors and/or *Other* investors is, in general weak and did not change significantly over the two sample periods.

[Insert Table 8 here]

4.5 Determinants of Changes in Ownership Structure

Table 9 provides a correlation matrix between changes in the ownership variables, size and firm value. Column 1 shows a strong and negative correlation between changes in managerial ownership and changes in holdings of pressure-resistant investors, pressure-sensitive investors and *Other* shareholders. The change in managerial ownership is also negatively related to changes in firm size, as measured by market value of equity. We investigate further the impact of size by splitting market value of equity into changes in the number of shares and changes in the price

per share as reflected in the cumulative average returns (CAR) from year-end 1993 to year-end 1998. The results indicate that the change in managerial ownership is negatively related to the change in the number of shares, suggesting that companies in our sample have increased their capital but managers have not subscribed to the new issues. In contrast, the relationship between the change in managerial ownership and the cumulative abnormal returns is positive suggesting that managers have increased their holdings in companies that generate high returns. The relationship between the change in managerial ownership and change in Q is weak. We also use alternative measures of performance, such as return on assets and annual abnormal returns. The relationship is always negative but not significant. However, these results may be driven by the joint impact of size as column 5 reports a positive and significant correlation between changes in Q and changes in the market value of equity.

Column 2 of Table 9 reports the correlation coefficient between changes in the holdings of pressure-resistant investors and the remaining variables. The results show a strong negative correlation with changes in the holdings of pressure-sensitive investors, *Other* investors and firm size. The correlation with changes in the number of shares, CAR and changes in Q is negative but weak.

Column 3, Table 9 reports a strong and positive correlation between changes in the holdings of pressure-sensitive investors and changes in the holdings of *Other* investors and negative correlation with changes in firm value, Q. Finally, Table 9, Column 4, indicates a strong negative correlation between changes in the holdings of *Other* investors and stock returns, CAR.

Overall, the results show that changes in the firm's ownership structure are consistent with the contractual hypothesis. Companies consider ownership by different categories as substitute means of resolving agency conflicts. However, further analysis is required to isolate the joint impact of changes in size and Q on the changes of the ownership structure.

[Insert Table 9 here]

Table 10 extends these results by taking into account all the potential factors that may affect changes in ownership structure. In Equations (1) we include changes in the firm market value of equity as an explanatory variable. In Equation (2) and (3) we split market value of equity into changes in the number of shares and cumulative

average returns and include only a subset of explanatory variables to correct for multicollinearity problem. The first column of Table 10 shows that changes in managerial ownership variable is negatively related to changes in the holdings of other categories of investors, in firm size, and changes in firm's idiosyncratic risk. However, it is positively related to changes in the relative proportion of tangible fixed assets (*K/S*) and *Q,* the firm value. The results imply that managers decrease their holdings when other categories of investors increase their stakes, company value increases, the variability of stock returns (sigma) increases, company value decreases and when firm's tangible fixed assets decrease. These results are consistent with the contractual hypothesis. They suggest that large companies enjoy economies of scale in monitoring by rating agencies, leading to a lower optimal level of managerial ownership, thus the negative relationship between changes in firm market value and changes in managerial ownership. In addition, the negative relationship between changes in managerial ownership and changes in sigma suggest that companies trade-off managerial portfolio diversification and incentives for performance. This, in turn, is reflected in the positive relation between changes in managerial ownership and changes in firm's value *Q* and changes in tangible fixed assets, *K/S*.

The second and third column of Table 10 reports the results based on changes in the number of shares and cumulative returns. The results show that it is not the change in share prices that explains movements in managerial ownership but, rather, changes in the number of shares issued by the company. As companies repurchase (issue new) shares, managerial holding increases (decreases) suggesting that managers do not participate in such activities, probably as a result of insider information and poor long-term performance of new issues documented in the previous literature (e.g., Levis, 1995, Loughran and Ritter, 1997). Therefore, the dilution effect explains changes in managerial ownership rather than the sales of equities by managers.

Columns 4 to 6, Table 10, report the results of the changes in holdings of pressure-resistant investors. The results indicate that changes in the holdings of pressure-resistant shareholders are negatively related to changes in the ownership of other groups, firm market value, new shares issued and changes in yield but positively related to changes in variability of stock returns, *Sigma*. The relationship with changes in firm value Q is weak. There is also an impact of the dilution effect on the changes

in the holdings of pressure-resistant investors as the coefficient of change in the number of shares is negative and significant (column 5).

The last 6 columns report the results of the changes in the holdings of pressure-sensitive investors and *Other* investors. We note the strong and positive relationship between changes in the two holdings but a negative relationship with changes in the holdings of managers and pressure-resistant shareholders. The relationship with changes in other variables, including size is, in most cases, weak, with the exception of the negative relationship with changes in the dividend yield.

[Insert Table 10 here]

4.6 Sensitivity analysis

Overall, our results provide strong evidence for the contractual hypothesis whereby companies opt for an optimal level of ownership structure that minimises agency costs. However, our results may be driven by the endogeneity problem, sample period and by the proxy variables used in our analysis. In this section we address these potential problems.

4.6.1. Endogeneity

The results based on the OLS regressions with lagged dependent variable may still be subject to endogeneity problem of ownership structure and firm value as companies may adopt a package of responses that will mitigate the agency problem. First, ownership structure will not only be dependent on firm's characteristics but also on other factors used to mitigate the agency problem such as board structure. Second, if, as argued above, companies adopt optimal ownership structures, the ownership structure of one type of shareholder will de dependent of that of other type of holders. In this case, a system of equations such as those of Agrawal and Knoeber (1996) or the instrumental variables method as those used by Palia (2001) will overcome the endogeneity problem. An attempt is made to correct this potential problem by using instrumental variables. We follow Palia (2001) and Mak and Li (2001) and use R&D/Sales, capital intensity (Fixed assets over total assets), standard deviation of stock returns and the age of the firms as instruments.[14]

We find that the coefficients and the *t*-statistics for ownership structures are virtually unchanged from Table 8, suggesting that the endogeneity and the model

misspecification are not likely to have an affect on our results. [15] As in Table 8, we find a strong non-linear relationship between managerial ownership and firm value in the 1993. For example, the coefficient of *Mgt* is 0.95 (t = 4.01) and that of Mgt^2 is – 0.001 (t = 2.01) in Equation (1). Similarly, the relationship between firm value and pressure resistant (*Pr*), pressure sensitive (*Ps),* and other investors, is negative and statistically significant in 1993. However, in 1998, the relationship between firm value and all ownership structure variables is weak, with the exception of the negative and significant relationship between firm value and pressure resistant shareholders. These results cast doubt on the monitoring role of large investors in the late 1990s.

4.6.2 Are the results sample-period specific?

We have analysed changes in the managerial ownership over a relatively long period using a large sample of UK companies. Previous similar studies are either single-year cross-sectional analysis (e.g., Faccio and Lasfer, 2000b) or have used a small number of companies over a relatively short-time period (e.g., Short and Keasey, 1999).[16] However, a potential concern is whether 1993 and 1998 are anomalous years for ownership structure. We are unable to collect ownership data for other years, but we can compare our results to those obtained in previous studies.

The results reported above show a strong relationship between managerial holding and firm value in 1993 and a weak relationship in the late 1990s. The results in the early 1990 are consistent with Short and Keasey (1999) who report a strong non-linear relationship between managerial ownership and firm value. However, in the late 1990s, Faccio and Lasfer (2000b) show that the relationship between firm value and managerial ownership is relatively weak. Thus our results appear to be consistent with both these studies. However, there are no other studies on the other types of investors we can refer to.

4.6.3 Results based on alternative proxy variables

In Table 1 we define most of the variables used in this study. However, since the literature does not offer single measures of firm size, scope for discretionary spending, free cash flow, managerial risk aversion and firm value, we need to test the sensitivity of the reported results by using a number of alternative variables to proxy for the hypotheses.

In terms of size, we use total log of assets or log of sales. The results are qualitatively similar to those reported above. For example, when we use change in total assets as a proxy for size in Table 10, we find a coefficient of –0.03 (t = -3.30) in the change of managerial ownership equation, -0.02 (t = -2.18) in the change of pressure-resistant equation, 0.001 (t = 0.18) in the change of pressure-sensitive equation and –0.022 (t = -2.21) in the change of the holdings of *Other* investors equation. Similar results are obtained using change in sales. We have also tested for robustness of the results in Table 10 by using change in beta as a measure of risk. We find a coefficient of –0.03 (t = -2.12) in the managerial ownership equation, 0.00 (t = 0.03) in the pressure-resistant equation, 0.02 (t = 1.73) in the change of pressure-sensitive equation and –0.05 (t = -2.86) in the change of the holdings of *Other* investors equation.

5. Conclusions

In this paper we show that the ownership structure of our sample companies has changed significantly in the last decade. We show that the median managerial ownership has decreased from 6.7 per cent to 3.6 per cent, 9.2 per cent to 7.8 per cent for pressure-resistant investors, 7.3 per cent to 6.2 per cent for pressure-sensitive investors and from 5.1 per cent to 4.2 per cent for the remaining shareholders. We then explain the rationale behind this change. We find that the fundamental determinants of ownership structure have not changed. In both 1993 and 1998 periods, ownership structure can be explained by proxy variables that measure size, scope for discretionary spending and risk aversion. All investors appear to hold stakes in small companies and the risk element is only observed for the case of managerial ownership. We also find a negative relationship between the ownership variables themselves, where, for example, companies with high pressure-resistant investors have low managerial ownership. The results suggest that companies adopt an optimal ownership structure that minimises agency conflict.

However, we report that the relationship between ownership structure and firm value has shifted significantly in the last decade. For example, we find a strong relationship between managerial holding and firm value in 1993 but this relationship became weak in the late 1990s. The analysis of the changes in ownership structures between the two periods shows that changes in firms' risk, profitability and size

contributed significantly to the decrease in ownership over the two periods. In addition, we report that it is not size *per se* that affect managerial ownership pressure-resistant shareholders but the dilution of ownership when companies issue new equity to which managers do not subscribe.

Our analysis is, however, limited into 1993 and 1998 because of data collection problems. We also haven't analysed where investors reinvest their funds and the post-sales performance of our companies. The extent to which these factors will alter our analysis is a subject of further research.

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Table 1 Description of variables

Mgt	The total proportion of common equity held by mangers as a fraction of common equity outstanding
Pr	The total proportion of common equity held by pressure resistant investors. These include holdings of fund managers, investment trusts, unit trusts and pension funds
Ps	The total proportion of common equity held by pressure sensitive investors. These include holdings of assurance companies, insurance companies, banks, employees, industrial and commercial companies, parent companies, venture capital companies and charities, trusts and foundations.
Other	The total proportion of common equity held by other investors. These include holdings of individuals, nominee, overseas investors, public sector and shares jointly held by more than one type of institution.
Q	The ratio of the value of the firm (market value of equity *plus* book value of long-term debt *over* total assets.
M/T	The ratio of the market value of equity *over* turnover
ROA	The ratio of profit before interest and tax *over* total assets
AR	The performance of the share over the past year relative to the Financial Times All (FTA) Share index.
Ln(mv)	Log of year-end market value of equity
Sigma	The standard deviation of the returns on the share computed using 5-year monthly returns.
DSigma	A dummy variable equal to unity if the data required to estimate Sigma is available, zero otherwise. We set missing observations of Sigma to zero to maintain sample size and reduce the risk of sample selection bias and include this dummy variable to allow the intercept term to capture the mean of the Sigma for missing values.
Beta	The sensitivity of the share price to general market movement computed by regressing stock returns on market index using 5-year monthly returns.
RD/K	The ratio of R&D expenditure over tangible fixed assets
RDum	A dummy variable equal to unity if R&D data is available, zero otherwise (see definition of Dsigma).
I/K	The ratio of investments in tangible fixed assets (property and plant and machinery) over tangible fixed assets
K/S	The ratio of tangible fixed assets over turnover
Y/S	The ratio of operating income over turnover
Lev %	The ratio of long-term debt *over* the sum of long-term debt and market value of equity
Yield	The ratio of annual dividend over year-end share price

Table 2: Descriptive statistics of ownership structure in 1992 and 1998.
The last column indicates the p-value of the t-statistics of the differences in means between 1992 and 1998 (p-stat) and the Mann Whitney p-value for differences in medians (MW).

Variable	Mean	Median	Minimum	Maximum	p-t-stat MW
Panel A. Percentage Ownership %					
Managerial 1993	16.1	6.7	0.0	80.9	0.007
Managerial 1998	13.3	3.6	0.0	96.0	0.002
Financial Companies 1993	22.1	19.4	0.0	84.1	0.385
Financial Companies 1998	21.4	18.8	0.0	78.8	0.309
Pressure Resistant 1993	12.5	9.2	0.0	72.8	0.582
Pressure Resistant 1998	12.1	7.8	0.0	78.0	0.068
Pressure Sensitive 1993	10.9	7.3	0.0	61.8	0.006
Pressure Sensitive 1998	9.3	6.2	0.0	70.3	0.004
Other 1993	13.0	5.1	0.0	100.0	0.078
Other 1998	11.3	4.2	0.0	100.0	0.001
Panel B. Real British Pound Ownership (£m)					
Managerial 1993	17.7	1.5	0	2,670	0.250
Managerial 1998	12.1	0.6	0	859	0.001
Financial Companies 1993	69.1	10.2	0	3,226	0.924
Financial Companies 1998	68.1	9.2	0	2,313	0.040
Pressure Resistant 1993	30.5	4.5	0	1,263	0.782
Pressure Resistant 1998	32.3	2.2	0	1,988	0.000
Pressure Sensitive 1993	30.4	3.6	0	1,087	0.258
Pressure Sensitive 1998	24.9	2.0	0	2,198	0.006
Other 1993	61.0	1.2	0	10,661	0.946
Other 1998	63.7	0.7	0	26,602	0.013

Table 3. Financial characteristics of the sample firms

Variable	Mean	Median	Minimum	Maximum
		Panel A. 1993 Data		
Market value (£m)	531	53	0	24,380
Total assets (£m)	652	53	0	69,135
Total Debt (£m)	131	7	0	8,023
Long-term loan (£m)	95	2	0	7,865
Tobin's Q	1.36	1.06	0.00	23.23
Market-to-turnover	2.78	0.88	0.01	341.12
Return on assets %	7.8	9.0	-140.0	67.2
Annual abnormal returns	8.74	2.95	-85.7	221.0
Sigma %	34.2	30.1	0	217.4
Beta	0.85	0.88	0	2.05
RD/K %	6.6	0	0	910.0
I/K %	25.3	20.6	0	221.1
K/S %	52.1	23.4	0	684
Y/S %	2.32	7.1	-2230	820
Yield %	2.7	2.6	0	121.1
Lev %	10.6	5.9	0	100
		Panel B. 1998 data		
Market value (£m)	1,084	55	0	144,104
Total assets (£m)	957	79	0	114,550
Total Debt (£m)	220	14	0	13,755
Long-term loan (£m)	172	7	0	10,918
Tobin's Q	1.19	0.89	0.15	23.30
Market-to-turnover	1.34	0.70	0.08	49.84
Return on assets %	6.1	9.2	-264.7	56.0
Annual abnormal returns	-22.7	-26.3	-123.3	384.7
Sigma	39.2	35.2	0	120.5
Beta	0.86	0.92	0	1.2
RD/K %	4.4	0	0	488.5
I/K %	21.0	16.8	0	161.5
K/S %	54.5	25.0	0	937.4
Y/S %	7.2	7.6	-620.0	153.0
Yield %	3.9	3.6	0	40.4
Lev %	16.7	12.6	0	92.0

Table 4 Size characteristics of ownership bands

The table reports the distribution of the median market value of equity in £m across ownership bands. % is the frequency of ownership relative to the whole 764 companies in the sample, Pr is for pressure resistant investors, Ps is for pressure sensitive investors.

Ownership	Mgt		Pr		Ps		Other	
	%	Median Size £m	%	Median Size £m	%	Median Size £m	%	Median Size £m
				Panel A. 1992 Data				
No holdings (A)	39	212	23	59	24	31	36	107
0.01% - 5%	6	59	13	59	16	79	14	62
5% - 10%	11	65	16	63	19	59	13	35
10% - 20%	12	28	25	71	24	65	13	35
20% - 40%	15	23	20	37	13	44	15	22
40% - 100%	16	15	3	18	4	20	9	26
All holdings (B)	61	29	77	52	75	59	64	34
MW-p (A) – (B)		<0.01		0.302		0.146		<0.01
				Panel B. 1998 Data				
No holdings (A)	46	188	33	99	30	40	42	108
0.01% - 5%	9	41	10	40	14	66	12	81
5% - 10%	9	39	11	62	22	57	16	41
10% - 20%	11	32	21	67	20	78	14	32
20% - 40%	13	20	21	45	11	74	9	23
40% - 100%	13	14	4	26	2	15	8	17
All holdings (B)	54	26	67	46	70	65	58	33
MW-p (A) – (B)		<0.01		<0.01		0.701		<0.01
MW-p 93 vs. 98 all holdings		0.895		0.392		0.810		0.693

Table 5 Correlation matrix

	Mgt	Pr	Ps	Other	Ln(MV)	Lev	Sigma	RD/K	I/K	Yield	Age
					Panel A. 1993 data						
Pr	-0.22										
Ps	-0.25	0.05									
Other	-0.15	-0.23	0.17								
Ln(MV)	-0.37	-0.09	-0.09	-0.23							
Lev	-0.17	0.03	0.03	0.08	-0.08						
Sigma	0.15	0.06	0.00	0.08	-0.37	0.05					
RD/K	0.06	-0.02	-0.05	-0.02	0.00	-0.09	0.06				
I/K	0.12	0.07	-0.05	-0.02	-0.04	-0.18	0.14	0.13			
Yield	-0.08	-0.02	0.01	-0.13	0.24	-0.10	-0.35	-0.04	-0.04		
Age	-0.09	0.01	-0.07	-0.08	0.02	-0.04	0.03	-0.03	-0.12	0.12	
K/S	-0.04	-0.04	-0.02	-0.01	0.05	0.20	0.01	-0.01	-0.05	-0.07	-0.04
					Panel B. 1998 data						
Pr	-0.20										
Ps	-0.22	-0.05									
Other	-0.13	-0.26	0.17								
Ln(MV)	-0.36	-0.11	-0.05	-0.29							
Lev	-0.13	0.09	-0.03	-0.09	0.07						
Sigma	0.17	0.04	-0.06	0.06	-0.34	0.03					
RD/K	0.07	0.00	-0.02	-0.01	-0.02	-0.10	0.07				
I/K	0.07	-0.02	-0.05	-0.02	-0.06	-0.05	0.21	0.13			
Yield	-0.08	0.02	0.13	-0.13	0.04	0.10	-0.26	-0.10	-0.13		
Age	-0.02	0.03	-0.08	-0.10	-0.02	0.05	-0.12	-0.01	-0.07	0.08	
K/S	-0.05	-0.05	0.02	0.02	0.06	0.05	0.04	0.07	-0.08	-0.08	-0.15

Table 6 Determinants of Ownership Structure. We regress the transformed dependent variable *Ln(Ownership/(1-Ownership)* on the explanatory variables.

Variables	Mgt		Pr		Ps		Other	
	1993	1998	1993	1998	1993	1998	1993	1998
Mgt			-2.32	-2.20	-2.04	-1.46	-2.64	-2.07
			(-10.20)	(-9.25)	(-8.47)	(-5.86)	(-8.50)	(-6.32)
Pr	-3.72	-4.21			-0.65	-0.67	-3.72	-3.04
	(-9.43)	(-9.41)			(-2.02)	(-2.18)	(-8.92)	(-7.02)
Ps	-3.21	-3.69	-0.78	-1.22			0.63	1.04
	(-7.34)	(-6.47)	(-2.45)	(-3.23)			(1.52)	(2.39)
Other	-2.18	-2.39	-1.89	-2.59	0.46	1.16		
	(-6.48)	(-5.64)	(-7.85)	(-8.80)	(1.80)	(4.38)		
Ln(MV)	-0.30	-0.29	-0.20	-0.14	-0.18	-0.09	-0.21	-0.15
	(-8.77)	(-8.90)	(-7.76)	(-5.87)	(-6.64)	(-4.01)	(-6.64)	(-5.34)
K/S	-0.06	-0.03	-0.08	-0.04	0.05	0.02	0.08	0.03
	(-1.18)	(-0.44)	(-2.65)	(-1.09)	(1.57)	(0.46)	(1.62)	(0.67)
Y/S	0.03	0.21	-0.03	-0.41	0.07	0.01	0.06	-0.04
	(0.91)	(0.64)	(-0.45)	(-1.20)	(2.07)	(0.53)	(1.40)	(-0.28)
Sigma	-0.006	-0.005	-0.002	-0.002	-0.002	-0.005	-0.001	0.006
	(-2.03)	(-1.47)	(-0.66)	(-0.51)	(-0.90)	(-1.88)	(-0.36)	(1.69)
Dsigma	0.03	0.35	0.002	-0.09	0.17	0.29	-0.32	-0.56
	(0.10)	(1.02)	(0.01)	(-0.36)	(0.83)	(1.47)	(-1.09)	(-1.94)
RD/K	0.18	0.10	0.07	0.05	0.46	0.03	0.02	0.38
	(0.95)	(0.93)	(0.49)	(0.63)	(1.20)	(0.39)	(0.11)	(1.50)
Rdum	-0.14	-0.10	-0.18	-0.03	-0.18	-0.05	-0.19	-0.33
	(-1.13)	(-0.72)	(-2.35)	(-0.37)	(-2.00)	(-0.63)	(-1.61)	(-2.59)
I/K	-0.01	-0.09	0.47	-0.04	0.04	-0.30	0.45	-0.45
	(-0.05)	(-0.36)	(2.29)	(-0.18)	(0.18)	(-1.66)	(1.55)	(-1.92)
Yield	-0.92	-3.60	-5.15	-2.82	2.30	1.38	0.41	-3.85
	(-1.03)	(-1.71)	(-2.10)	(-2.24)	(0.92)	(1.19)	(0.45)	(-1.96)
Utilities	0.40	-0.57	-0.008	0.23	0.02	-0.24	0.13	0.16
	(1.31)	(-1.98)	(-0.04)	(0.98)	(0.09)	(-1.13)	(0.48)	(0.48)
Lev	-0.68	-0.60	0.23	0.20	-0.17	-0.13	-0.37	-0.59
	(-1.47)	(-1.65)	(0.78)	(0.83)	(-0.55)	(-0.55)	(-0.92)	(-1.88)
Adj. R^2	0.36	0.361	0.222	0.246	0.184	0.159	0.25	0.254
p-value F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 7. Correlation matrix between firm value and ownership structure

	Mgt	Pr	Ps	Other
Panel A. 1993 data				
Q	0.12***	-0.06	-0.07**	-0.06
MT	0.04	-0.05	-0.04	0.01
MB	0.08***	-0.02	-0.07**	-0.05
ROA	0.00	-0.08**	0.00	-0.01
AR	0.11***	-0.01	0.04	0.11***
Panel B. 1998 data				
Q	-0.09***	-0.12***	-0.04	-0.02
MT	-0.07**	-0.12***	0.03	0.11***
MB	-0.03	-0.06	-0.06	0.11***
ROA	-0.10***	-0.03	0.03	-0.02
AR	-0.04	-0.02	-0.06	-0.02

Table 8. Relationship between firm value and ownership structure. We regress the firm's Tobin's Q on the transformed dependent variable *Ln(Ownership/(1-Ownership)* and other explanatory variables.

	Mgt				Pr				Ps				Other			
	1993		1998		1993		1998		1993		1998		1993		1998	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Mgt	0.81	0.70	-0.67	0.54												
	(3.35)	(3.45)	(-0.90)	(0.69)												
Mgt^2	-0.0003	-0.0002	0.11	-1.17												
	(-1.91)	(-1.68)	(0.09)	(-1.06)												
Pr					-0.65	-0.32	-1.17	-0.67								
					(-1.64)	(-1.09)	(-3.22)	(-2.04)								
Ps									-0.82	-0.37	-0.54	0.11				
									(-1.99)	(-1.19)	(-1.22)	(0.27)				
Other													-0.43	0.07	-0.14	0.38
													(-1.61)	(0.31)	(-0.54)	(1.47)
Ln(MV		0.18		0.22		0.14		0.21		0.14		0.22		0.142		0.23
)		(7.39)		(10.1)		(6.21)		(10.5)		(6.20)		(10.8)		(6.35)		(10.8)
		0.004		-0.11		0.04		-0.12		0.004		-0.11		0.004		-0.12
K/S		(1.08)		(-2.69)		(1.11)		(-2.85)		(1.11)		(-2.74)		(1.17)		(-2.86)
		-0.08		-0.07		-0.08		-0.08		-0.08		-0.07		-0.08		-0.08
Y/S		(-2.29)		(-2.42)		(-2.22)		(-2.55)		(-2.18)		(-2.46)		(-2.24)		(-2.59)
		0.005		0.009		0.005		0.008		0.005		0.009		0.005		0.009
Sigma		(2.21)		(2.98)		(1.96)		(2.83)		(1.91)		(2.92)		(1.98)		(2.87)
		-0.32		-0.37		-0.29		-0.31		-0.28		-0.36		-0.29		-0.28
Dsigma		(-1.56)		(-1.51)		(-1.38)		(-1.27)		(-1.35)		(-1.47)		(-1.37)		(-1.15)
		0.13		0.33		0.16		0.33		0.16		0.33		0.17		0.33
RD/K		(0.73)		(2.87)		(0.91)		(2.91)		(0.93)		(2.87)		(0.94)		(2.89)
		-0.015		0.06		-0.04		0.06		-0.05		0.06		-0.04		0.07
RDum		(-0.18)		(0.63)		(-0.48)		(0.58)		(-0.53)		(0.57)		(-0.46)		(0.68)
		0.94		0.48		0.98		0.46		0.95		0.47		0.97		0.49
I/K		(4.49)		(2.23)		(4.63)		(2.16)		(4.50)		(2.21)		(4.57)		(2.27)

		-3.37		-8.8		-2.56		-8.82		-2.55		-8.82		-2.53		-8.58
Yield		(-3.33)		(-5.82)		(-3.11)		(-5.83)		(-3.06)		(-5.78)		(-3.06)		(-5.65)
		-2.04		-0.80		-2.20		-0.09		-2.21		-0.78		-2.22		-0.75
Lev		(-6.66)		(-2.79)		(-7.19)		(-4.34)		(-7.23)		(-2.73)		(-7.26)		(-2.62)
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Industry																
Adj. R^2	0.02	0.234	0.01	0.233	0.02	0.221	0.12	0.24	0.04	0.221	0.001	0.232	0.002	0.22	0.00	0.234
p-of F	0.00	0.00	0.05	0.00	0.10	0.00	0.00	0.00	0.05	0.00	0.22	0.00	0.11	0.00	0.59	0.00

Table 9. Correlation matrix between changes in ownership variables, size and firm value. Δ is for change from 1993 to 1998; mgt, pr, pr and other are for holdings by managers, pressure resistant, pressure sensitive and other investors (see Table 1 for definitions); CAR_{93-98} is for cumulative average returns from year-end 1993 to year-end 1998; NS is for number of shares, Mv is for market value of equity. ***, **, and * significant at 0.01, 0.05 and 0.10 levels, respectively.

	Δ mgt	Δ Pr	Δ Ps	Δ Other	Δ Mv	Δ NS	CAR_{93-98}
Δ Pr	-0.13***						
Δ Ps	-0.21***	-0.11***					
Δ Other	-0.30***	-0.22***	0.18***				
Δ Mv	-0.08**	-0.07**	-0.01	-0.03			
Δ NS	-0.20***	-0.03	0.06	0.05	0.30***		
CAR_{93-98}	0.06*	-0.05	-0.05	-0.06*	0.76***	-0.40***	
Δ Q	-0.01	-0.02	-0.06*	-0.01	0.65***	0.09***	0.50***

Table 10. Regression results on the determinants of changes in ownership structure

	Mgt			Pr			Ps			Other		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Constant	-0.03	-0.02	-0.03	-0.007	-0.002	-0.004	-0.02	-0.013	-0.014	-0.017	-0.021	-0.023
	(-4.71)	(-5.22)	(-5.22)	(-1.09)	(-0.35)	(-0.90)	(-3.44)	(-2.56)	(-2.49)	(-2.40)	(-3.40)	(-3.50)
Δ Mgt				-0.27	-0.25	-0.23	-0.16	-0.17	-0.18	-0.33	-0.32	-0.32
				(-6.46)	(-5.56)	(-5.23)	(-4.73)	(-4.70)	(-4.78)	(-7.50)	(-7.31)	(-7.32)
Δ Pr	-0.23	-0.22	-0.21				-0.11	-0.13	-0.13	-0.27	-0.26	-0.26
	(-6.46)	(-5.67)	(-5.47)				(-3.36)	(-3.78)	(-3.82)	(-6.63)	(-6.43)	(-6.45)
Δ Ps	-0.22	-0.21	-0.221	-0.17	-0.20	-0.20				0.138	0.143	0.138
	(-4.73)	(-4.40)	(-4.62)	(-3.36)	(-3.78)	(-3.79)				(2.62)	(2.72)	(2.62)
Δ Other	-0.26	-0.22	-0.227	-0.25	-0.21	-0.21	0.08	0.11	0.11			
	(-7.50)	(-6.19)	(-6.29)	(-6.63)	(-5.30)	(-5.30)	(2.62)	(3.53)	(3.32)			
Δ Mv	-0.042			-0.03			-0.001			-0.018		
	(-5.46)			(-3.40)			(-0.14)			(-2.07)		
Δ NS		-0.04			-0.026			-0.00			-0.005	
		(-3.99)			(-2.70)			(-0.07)			(-0.61)	
CAR_{93-98}			-0.006			-0.002			-0.009			-0.006
			(-0.86)			(-0.32)			(-1.72)			(-1.01)
Δ K/S	0.02	0.021	0.018	0.01			-0.006			-0.01	-0.14	-0.015
	(2.59)	(2.27)	(1.94)	(1.18)			(-0.82)			(-1.13)	(-1.57)	(-1.68)
Δ Sigma	-0.04			0.002	0.04	0.03	0.008	0.03		0.003		
	(-2.40)			(0.12)	(2.01)	(1.54)	(0.58)	(1.84)		(0.14)		
Δ RD/K	-0.03			0.02	0.046	0.04	-0.014			-0.04	-0.042	-0.043
	(-1.30)			(0.89)	(1.64)	(1.46)	(-0.64)			(-1.50)	(-1.45)	(-1.48)
Δ I/K	0.002			0.005			0.003	0.007	0.007	0.005		
	(0.39			(0.91)			(0.80)	(1.48)	(1.49)	(0.80)		
Δ Yield	0.04			-0.28	-0.35	-0.32	-0.22		-0.27	-0.45	-0.45	-0.47
	(0.23)			(-1.51)	(-1.93)	(-1.69)	(-1.48)		(-1.72)	(-2.28)	(-2.45)	(-2.54)
Δ Lev	-0.006	0.05		-0.03			0.007			-0.04		
	(-0.17)	(1.58)		(-0.89)			(0.23)			(-1.02)		
Δ Q	0.05	0.02	0.018	0.02			-0.01			0.014		
	(4.00)	(2.02)	(1.47)	(1.57)			(-1.09)			(1.05)		
Adj. R^2	0.192	0.18	0.144	0.116	0.113	0.101	0.081	0.106	0.108	0.164	0.173	0.173
p-of F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix A1. Details of percentage ownership (%) by each category of investors in the UK.

Variable	Mean	Median	Min	Max	Freq	p-t-stat MW
Panel A. Pressure-resistant investors						
Unit Trusts 93	0.5	0.0	0.0	26.0	6.7	0.31
Unit Trusts 98	0.4	0.0	0.0	20.4	7.1	0.91
Investment Trusts 93	1.9	0.0	0.0	65.2	23.3	0.08
Investment Trusts 98	2.3	0.0	0.0	43.5	23.3	0.75
Fund Managers 93	7.7	4.9	0.0	56.4	59.4	0.80
Fund Managers 98	7.8	0.0	0.0	62.4	49.4	0.09
Pension Funds 93	2.4	0.0	0.0	66.4	30.9	0.00
Pension Funds 98	1.6	0.0	0.0	56.9	21.9	0.00
Panel B. Pressure-sensitive investors						
Charities Trusts 93	0.3	0.0	0.0	50.1	2.4	0.45
Charities Trusts 98	0.2	0.0	0.0	50.1	2.0	0.89
Industrial and Commercial Cos 93	3.2	0.0	0.0	54.9	23.6	0.01
Industrial and Commercial Cos 98	2.2	0.0	0.0	70.3	15.6	0.00
Employees 93	0.1	0.0	0.0	48.2	1.0	0.78
Employees 98	0.1	0.0	0.0	23.1	1.3	0.93
Parent Companies 93	1.9	0.0	0.0	100.0	2.7	0.59
Parent Companies 98	1.6	0.0	0.0	100.0	2.0	0.79
Banks 93	1.5	0.0	0.0	28.8	25.0	0.07
Banks 98	1.2	0.0	0.0	26.2	15.3	0.00
Venture Capitalists 93	0.8	0.0	0.0	59.4	7.5	0.05
Venture Capitalists 98	0.5	0.0	0.0	23.7	5.4	0.47
Insurance Companies 93	4.3	3.0	0.0	42.8	50.9	0.38
Insurance Companies 98	4.0	0.0	0.0	40.9	46.3	0.19
Assurance Companies 93	0.7	0.0	0.0	17.5	11.9	0.02
Assurance Companies 98	1.0	0.0	0.0	20.3	15.6	0.20
Panel A. Other investors						
Joint Holdings 93	0.2	0.0	0.0	12.4	2.9	0.00
Joint Holdings 98	0.0	0.0	0.0	6.5	0.5	0.42
Overseas Investors 93	2.8	0.0	0.0	68.1	23.4	0.04
Overseas Investors 98	3.8	0.0	0.0	96.3	27.6	0.11
Nominee Holdings 93	1.2	0.0	0.0	71.8	11.5	0.54
Nominee Holdings 98	1.4	0.0	0.0	57.1	12.7	0.67
Group of institutions 93	1.3	0.0	0.0	19.3	20.7	0.48
Group of institutions 98	1.4	0.0	0.0	24.4	17.4	0.43
Public Sector 93	0.2	0.0	0.0	40.5	1.3	0.32
Public Sector 98	0.1	0.0	0.0	33.0	1.3	0.99
Individuals 93	3.0	0.0	0.0	77.6	25.5	0.00
Individuals 98	2.0	0.0	0.0	50.5	20.9	0.09
Other Financial Institutions 93	1.2	0.0	0.0	42.6	11.3	0.89
Other Financial Institutions 98	1.2	0.0	0.0	75.0	10.3	0.76

Notes

[1] See Byrd, Parrino and Pritsch (1998) for a review of stockholder-manager conflicts and the effectiveness of the various mechanisms that can control these problems.

[2] Other possibilities include; for example, making share options a bigger part of total remuneration and structuring the board in such a way as to make it able to monitor managers.

[3] See for example Diamond (1984), Admati, Pfleiderer and Zechner (1994), Maug (1998) and Kahn and Winton (1998)

[4] Citing a 1995 survey carried out by Shelley Taylor that show that 75 per cent of shares of the largest FTSE 100 companies are in the hands of fund managers, including 28 per cent held by pension funds, 22 per cent held by insurance companies, 6.8 per cent held by unit trusts and 16.3 per cent held by overseas institutional investors.

[5] Other studies suggest that the relationship between ownership, such as the fraction of shares held by insiders and performance is not linear but roof-shaped (e.g. Morck, Shleifer and Vishny, 1988; McConnell and Servaes, 1990; Stulz, 1988).

[6] These mechanisms include managerial shareholding (Faccio and Lasfer, 2000b, McConnell and Servaes, 1990; Short and Keasey, 1999), outside directors (Cotter, Shivdasani and Zenner, 1997), debt policy (Lang, Ofek and Stulz, 1996; Lasfer, 1995; McConnell and Servaes, 1995), the market for corporate control and incentive contracts (Hart, 1995; Hart and Holmstrom, 1987), large intermediaries (Admati *et al*, 1994; Diamond, 1984), and long-term relationships (Ayres and Cramton, 1993).

[7] See Black (1998) and Karpoff (1998) for a survey on shareholder activism literature.

[8] See Chew (1997) for a collection of papers dealing with these two corporate governance systems.

[9] The remaining 20 per cent are split between public sector, industrial and commercial companies and overseas investors.

[10] Extel Financial (Extel Cards) provides only the shareholding information for the current year. We were not able to extend our analysis using company accounts because only few companies disclose the information on shareholding by category of shareholders. Due to our large sample size, other options such as the use of the Jordan ownership database and of the company share registers were not feasible because the data is not in machine-readable form. Other databases such as the Crawford's Directory of City Connections provide shareholding above 5 per cent, while our analysis is based on 3 per cent threshold.

[11] When the identity of the shareholder is not disclosed, the database reports the ownership under "nominee" holdings. We have also analysed the reported "nominee" holdings and allocate these, where possible, to the ultimate shareholder. When the disagregated data is not available, we left the holdings under "nominees".

[12] In this study, we define ownership as a shareholder, other than directors, that individually holds at least 3% of a company's ordinary shares. This level is set by disclosure rules (Company Act 1995, Sections 198 and 199). The threshold was 5 per cent from 1985 to 1989.

[13] We use all 2100 UK quoted companies. We find that the average (median) market value of equity in 1998 of £752m (£43m) with a minimum of £0.044m and a maximum of £144 bn. For the FTSE 100 companies, the average (median) market value of equity is £11,946m (£5,623m) with a minimum of £204m and a maximum of £144 bn. The respective values in 1993 are: £399m (£43) with a minimum of 0 and a maximum of £36 bn for the 1980 quoted UK companies and £5.4 bn (£3.05 bn) with a minimum of £90m and a maximum of £36 bn for the FTSE 100 companies. This suggests that our sample is representative and it is not tilted towards small or large companies.

[14] However, the equations may suffer from misspecification bias, as data that is specific to the different types of investors is not available. For example, for instruments Palia (2001) use CEO experience, CEO quality and CEO age and he argues that variables that affect both firm value and managerial ownership cannot be used as instruments. Unfortunately this specific data on managers and similar data on institutional investors is not available in the UK. Thus, we recognise that the endogeneity issue may not be directly accounted for in this paper, but we expect the use of the lagged independent variables method to mitigate this problem.

[15] These results, available from the authors, are not reported for space considerations.

[16] For example, Short and Keasey, 1999 analyse the relationship between managerial ownership and firm value using a sample of 225 companies over the 1988-1992 period.