Institutional Investment in UK firms: Do Corporate Internal Control Mechanisms Matter?

Arif Khurshed*

Manchester Business School, University of Manchester, UK

Stephen Lin**

Florida International University, USA

Mingzhu Wang***

Manchester Business School, University of Manchester, UK

Acknowledgement: The authors would like to thank the participants of EFMA Behavioural Finance Symposium (April 2006) at University of Durham, for their valuable comments.

* Arif Khurshed (Corresponding author) Crawford House, MBS East, University of Manchester, Manchester M13 9PL, UK; ***Tel***:+44 (0)161 275 4475; ***Fax***: +44 (0)161 275 4023; ***Email***: arif.khurshed@mbs.ac.uk.

** Stephen Lin, Florida International University, USA, ***Tel***: 001-1305 4636 682; ***Email***: lins@fiu.edu

*** Mingzhu Wang, Crawford House, MBS East, University of Manchester, Manchester M13 9PL, UK; ***Tel***: +44 (0)870 8357 513; ***Email***: mingzhu.wang@postgrad.manchester.ac.uk.

Abstract

Using a large UK sample, we find that institutional ownership is negatively associated with directors' ownership and is positively associated with board composition of directors, suggesting that institutional investors regard directors' ownership and board composition as the substitute and complementary control mechanisms respectively. Contrary to the findings of existing US studies, we show that UK institutional investors prefer smaller firms, and firms with smaller boards, shorter listing history, and low trading liquidity. We also find institutional shareholding is negatively associated with dividend yield after the tax exemption of dividend income was finally terminated due to the introduction of the Financial Act 97. Finally, our results indicate that the investment preference of UK institutional investors – in terms of internal control mechanisms and firm specific characteristics – varies according to the level of their ownership.

Keywords: institutional ownership, directors' ownership, board structure

EFMA Classification codes: 150, 330

1. Introduction

For a number of stock markets around the world, institutional investors are perceived to be important players in listed firms. Many US studies (Badrinath et al., 1989, 1996; Lakonishok et al., 1991, 1992, 1994; Cready, 1994; Del Guercio, 1996; Falkenstein, 1996; Gompers and Metrick, 2001; and Bennett et al., 2003) document that US institutional investors prefer to invest in firms with superior past financial performance, lower volatility of share price, high trading liquidity, larger size, and longer listing history. Several studies investigate the investment behaviour of institutional investors outside the US. For example, using Danish data, Nielsen (2004) finds that institutional investors prefer large and liquid stocks although their demand for these stock characteristics might not be homogeneous. He finds that unlike banks, insurance companies, and mutual funds, pension fund companies do not prefer liquid stocks. Barucci (2005) finds Italian institutional investors prefer shares with low volatility, low transaction costs, and high profitability. Italian institutional investors also prefer companies that have less concentrated ownership and focus on shareholder's value. Besides, Barucci (2005) finds that bank companies prefer firms with low (high) profitability (leverage), suggesting that banks monitor lending relationship or intend to hold shares of these firms after a restructuring process. Hussain (2000) documents that UK institutional investors generally prefer firms that are smaller and have relatively lower ownership concentration. Ferreira and Matos (2006) investigate types of firms that attract institutional investors from around the world by examining both firm and country level characteristics. They find that institutional investors prefer large and liquid stocks with good corporate governance practice especially in countries where country-level investor protection and quality of institutions are weak. There is also evidence suggesting that their investment preference vary across time. The above findings suggest that investment preferences of institutional shareholders vary across time, between different countries and different types of institutional shareholders within the same countries.

Most of the previous studies investigate the relationship between institutional ownership (IO) and firm financial characteristics, and have largely ignored the extent to which corporate governance control mechanisms influence the investment behaviour of institutional investors and the interaction between them. This is an important issue as IO is significant in many countries such

as the US and the UK[1]. Many studies (Doidge et al, 2005; Stulz, 2005; Ferreira and Matos, 2006) have documented that institutional investors prefer firms with good governance practices. This investment preference can easily trigger on investment shift and dramatically affect firms' equity price. A study by Gompers and Metrick (2001) finds large US institutional investors almost doubled their investments from 1980 to 1996, causing a significant increase in demand for large firms. They also find that this investment shift accounts for a nearly 50 percent increase in the price of large companies and can explain part of the disappearance of the small-company stock premium. Moreover, IO is normally in the form of blockholding, which is regarded as a part of efficient governance control mechanisms that are used to monitor firm management. Since institutional investors hold more significant stakes than individual shareholdings, they can easily influence companies' operating, investment, and governance policies in many ways. For example, institutional investors can have their representatives sitting on the board to monitor firms' decision making process. They can register protest votes at the annual meeting in an effort to persuade the company to adopt a more independent board of directors. Institutional investors can also monitor the incentives provided to top management through compensation contracts (Hartzel and Starks, 2003).

Using a large UK sample, this study examines the extent to which directors' ownership (DO) and board composition (BC) (measured as the proportion of non-executive directors[2] sitting on the board) jointly affect the investment decision of institutional investors after controlling for other factors such as firm size, book-to-market ratio, leverage, past performance, etc. We focus on these two internal control mechanisms (DO and BC) because of the following three reasons.

First, Jensen and Warner (1988) note that the relations between shareholdings by managers, outside blockholders, and institutions are not well understood. Managerial ownership aims to align the interests of managers with those of shareholders and is found to have an impact on firm performance and valuation. Studies by Morck et al (1988) and McConnell and Servaes (1990)

[1] According to Institutional Investors Statistical Yearbooks (1992-2001) issued by OECD. In the United States, the total volume of assets of institutional investors more than doubled since 1993 reaching US$19257 billion in 2001. Institutional investors in Japan posses total assets of US$3645 billion. Within the EU area, although United Kingdom has recorded a significant fall in the institutional investments during 2000 and 2001, it remains the leading country in the EU with a total amounting to US$2740 billion.

[2] US literature mostly uses "outside directors", which are similar to the definition of "non-executive directors" in the UK. Therefore, we use the latter through out the paper even in literature review of US studies.

find that DO is associated with firm valuation in a non-linear pattern. Since DO and IO are alternate governance control mechanisms to reduce agency costs, any change in IO could affect DO, which in turn could affect firm performance and value. Using US data, Bathala et al. (1994) and Chen and Steiner (1999) find a negative association between IO and DO. Very little work, however, has been done outside the US. Since corporate ownership is influenced by a country's unique social, economic, and legal systems, it is worthwhile to seek for further empirical evidence using non-US data. Short and Keasey (1999) find evidence supporting that the underlying differences in the corporate governance structure in the US and UK have contributed to a very different non-linear relation between management ownership and firm performance in both countries.

Second, since a firm's operating and investment decisions are made by the board of directors; independent non-executive directors (NEDs) play a very important role in monitoring managers. They are hired on behalf of shareholders to reduce the agency problem arising from the separation of ownership from control. Although the evidence on the exact nature of the relationship between firm performance and NEDs is still mixed (Bhagat and Black, 1999), many surveys (Useem et al, 1993; Ramsay et al, 1998; Coombes and Watson, 2000) suggest that institutional investors believe board structure is as important as financial performance. Many previous studies have documented that NEDs are able to reduce financial fraud and improve quality of accounting information. For example, NEDs are found to play an important role in CEO dismissal (Weisbach, 1988), and firms with high board composition (BC) of directors are less likely to suffer from financial statement fraud (Beasley, 1996). Using UK data, Peasnell et al (2005) find that firms with high proportion of NEDs sitting on the board recognize less income increasing accruals. Ajinkya et al (2003) finds that firms with greater IO and NEDs are more likely to issue management earnings forecasts. Their earnings forecasts also appear to be more specific and accurate. Using a small US sample, Bathala and Rao (1995) find a positive association between board composition and IO. Yang et al (2006) find a negative association between the proportion of executive directors and IO. Both studies conclude that institutional investors take board structure into account when making their investment decision. Unlike the board structure in the UK, US companies tend to have larger boards and more NEDs sitting on

the board. Very little work, however, has focused on the relationship between BC and IO especially outside the US.

Finally, DO, NEDs, and IO are alternative control mechanisms, which can be substituted or complemented by each other. More importantly, DO and NEDs are internal control mechanisms, which could be different from an external control mechanism like IO. The control power of institutional investors is from takeover market. However, institutional investors can simply sell the shares of poorly performing firms rather than intervening. By examining the relationship between DO, NEDs, and IO we can further our understanding of how they could interact with each other as complements or substitutes. Previous studies have largely ignored this issue especially using non-US data.

Using a large UK sample, our results show that institutional ownership is negatively associated with directors' ownership, and the relation appears to be non-linear. We also find a positive association between institutional ownership and the proportion of NEDs sitting on the board. This finding suggests that institutional investors regard directors' ownership as a substitute control mechanism but perceive board composition as a complementary control mechanism when making investment decisions. In addition, we find UK institutional investors prefer smaller firms, and firms with smaller boards, shorter listing history, and low share turnover[3]. This is different from the findings in the previous studies which show that US institutional investors prefer large firms and firms with longer listing history and higher trading liquidity. We also find IO is negatively associated with dividend yield after the tax exemption of dividend income was finally terminated due to the introduction of the Financial Act 1997 (FA97) [4]. Finally, our results also indicate that the investment preference of UK institutional investors in relation to internal control mechanisms and firm specific characteristics varies according to the level of their ownership.

This paper contributes to the existing literature in the following three ways: (1) we investigate the endogenous relationship between institutional ownership and two important internal governance

[3] Share turnover here is measured as the trading volume deflated by total asset.
[4] Before 1997, pension funds were exempt from tax on their dividends income, but this tax exemption was abolished after the FA97. The tax exemption for insurance companies was abolished by FA97 as well, but it came into effect in 1999.

control mechanisms, i.e. directors' ownership and board structure; (2) we examine if the Financial Act 97 which abolished the exemption from dividend tax brought about any change in the investment behaviour of UK institutional investors; (3) we provide further empirical evidence on how firm level specific factors affect the investment preference of institutional ownership using data from outside the US.

The rest of the paper is organized as follows. Section 2 reviews the literature and develops our testable hypotheses. Section 3 discusses the research methodology. Section 4 describes the sample and data used in this study. Section 5 discusses the results while section 6 reports some sensitivity tests. Finally we draw conclusions in Section 7.

2. Literature Review and the Development of Hypotheses

2.1 Surveys on Institutional Ownership and Corporate Governance

Our interest in the endogenous relationship between institutional ownership and corporate internal control mechanisms stems primarily from the surveys reported by Useem et al (1993) and Coombes and Watson (2000). A Mckinsey survey (reported by Coombes and Watson 2000) of more than 200 institutional investors with investments across the world shows that governance is a significant factor in their investment decision. Three-quarters of the institutional investors say that board practice of a well-governed firm is at least as important as its financial performance. They also believe a well-governed firm should have a majority of independent directors and formal evaluation for directors, and be responsive to the requests from investors. In a separate survey of pension funds and investment managers, Useem et al (1993) find that the composition and function of the board is critical to US institutional investors, who appear to prefer an independent board with board members who have diversified skills and experiences. A survey by Ramsay et al (1998) also finds similar responses from the participating Australian institutional investors.

There are some differences in institutional ownership structure between UK and US. First, institutional ownership in the UK is much higher than that in the US[5]. Second, US institutional investors have been regulated under the "Prudent-Man" law since 1970s. UK institutional investors, however, did not have the same regulation until the Myner's Report was released in 2001[6]. Finally, UK institutional investors are more passive than their US counterparts in terms of the usage of their voting rights or raising proposals when firms' corporate governance is bad (Mallin, 1995, 1999; Ersoy-Bozcuk and Lasfer, 2001). In the US, voting turnout, the level of votes represented at the annual meeting, can easily reach 70-80% in many companies (Gillan and Stark, 2003). According to a survey sponsored by the National Association of Pension Funds (NAPF)[7], only 50% of the institutional investors in the UK exercised their voting rights in 1999. Although this percentage may have increased in recent years (because of external pressure on institutions to vote their shares), it is still very low by the US standards. Similarly, a report from the Manifest Voting Proxy Agency[8] states that, in the UK, only 4 shareholder proposals were put forward at the board meetings for the whole year of 1997, which is described as "rare as hens' teeth". However, this does not imply that UK institutional investors do not give importance to firms' corporate governance at all. In January 2003, *Just Pensions*[9] published the results of a survey entitled "Will UK Pension Funds Become More Responsible?". Trustees were asked to answer which of the chosen six areas of corporate behaviour, including good corporate governance, quality of consumer relations, good employee practices, communication and transparency on social and environmental practices and effective environmental management would have an impact on the market value of the FTSE100 firms in both short and longer terms. One key finding of this survey is that good corporate governance was regarded as the most significant factor for firm valuation. 38% of the participating trustees believe that it has a

[5] For example in 1963, institutional investors held at an average 37.5% stake in listed UK firms which increased to 66% in 1991 and then slightly decreased to 52.9 % in 2003 (ONS). Bennett et al. (2003) show the average institutional ownership in US listed firms increased from around 16% in 1983 to approximately 31% in 1996 with an average of 23% from 1983 to 1996.

[6] Although there was a so called "prudent man" rule in 1995 in the UK, it only requires institutional investors to invest for their clients as a normal "business man" rather than "prudent man" with expertise. Therefore, we think the requirement in Myner's Review (2001) is closer to the "Prudent Man" rule in the US.

[7] The National Association of Pension Funds is the principal UK body representing the interest of occupational pension funds. Its membership includes companies, local authorities, and public sector bodies.

[8] Manifest Voting Proxy Agency is Europe's independent proxy governance and global electronic voting service.

[9] *Just Pensions* is a programme of the UK Social Investment Forum (UKSIF) - the UK's membership network for socially responsible investment (SRI). *Just Pensions* aims to educate and influence UK pension funds and other institutional investors about the importance of international development issues in their practice of SRI.

substantial positive impact on the market value of the FTSE100 firms within the next year; and 52% of the participating trustees believe so within the next 5-10 years.

All of these surveys point out an important relationship between institutional ownership and firms' corporate governance status. Holland (1999) argues that UK institutional investors have significant information advantage because they do not only refer to the public information released from companies (such as accounting information in annual reports) but also have access to private information through direct and indirect communication with firm management. As a result, institutional investors are able to diagnose the potential problems companies face in terms of operating strategy, management quality, effectiveness of board, and financial performance. Holland (1999) concludes that the information advantage enables UK institutional investors to influence certain financial reporting practices, which in turn further improves firms' corporate governance.

The following section summarises previous studies with respect to institutional ownership, directors' ownership, board composition, and other important firm specific characteristics.

2.2 Directors' Ownership

Jensen and Meckling (1976) show that the agency cost can be mitigated by increasing managerial ownership with the aim of aligning the interests of managers with those of outside shareholders. However, the empirical evidence on this issue is still mixed. By investigating the 371 largest US firms on *Fortune* 500 in the year 1980, Morck et al. (1988) find a non-linear relationship between firm value (measured by Tobin Q) and directors' ownership. They find that firm value increases as the directors' ownership increases in the range of 0 to 5% and beyond 25% (the convergence effect) but decreases when the directors' ownership increases in the range between 5% to 25% (the entrenchment effect). McConnell and Servaes (1990) perform a similar test on two different US samples selected in 1976 and 1986. They find the relation between director ownership and firm value to be 'roof-shaped' with a peak at 69% of ownership in 1976 and 41% in 1986, respectively. In the UK, Curcio (1994) investigates 389 listed manufacturing firms during 1972-1986 and finds a similar 'roof-shaped' relationship between firm value and directors' ownership.

He shows that Tobin's Q is significantly decreasing with board ownership ranging between 25% and 100%. Short and Keasey (1999) also investigate this relation during 1988-1992 and find similar evidence to Morck et al. (1988) in the sense that firm performance, measured by ROE and valuation ratio, increases with DO ranging between 0 and 12% and beyond 40% but significantly decreases with DO ranging between 12% and 40%.

Previous studies on the US generally find a negative relationship between IO and DO. For example, Bathala et al. (1994) examine the impact of institutional holdings on DO and debt policy. They find that the use of debt financing and DO are inversely related to institutional ownership. Although their study focuses on the endogenous relation between debt financing and directors' ownership, a potentially endogenous relation between institutional ownership and directors' ownership deserves to be further investigated. Similarly, Chen and Steiner (1999) assert that DO and IO are substitute monitoring mechanisms in the US corporate governance system. This finding is also confirmed by Hussain (2000) using a very small UK sample. Moreover, empirical results from previous studies suggest that whether the relationship between DO and firm performance is non-linear depending on whether the convergence effect or the management entrenchment effect dominates. Therefore, we predict:

Hypothesis 1: *There is a negative and non-linear relationship between the level of IO and DO*

2.3 Board Composition

The role of the board of directors as a monitoring body has been widely studied in the literature (e.g. Fama and Jensen, 1983; Rosenstein and Wyatt, 1990; Jensen, 1993). Proponents of the board-monitoring view believe that NEDs are central to the effective resolution of the agency problems between managers and shareholders. Consistent with this view, using the event study methodology, Rosenstein and Wyatt (1990) find a positive and significant market response to new appointments of NEDs by US firms. Many studies examine the monitoring role of NEDs by investigating the effect of board composition on firm performance through particular board tasks, such as replacing the CEO, making a takeover bid or defending against a takeover bid. Weisbach (1988) shows that boards with at least 60% non-executive directors are more likely to fire a

poorly performing CEO than other boards. Cotter et al (1997) find that tender offer targets, with more NEDs sitting on boards, experience 20% higher stock price return than other boards. On the other hand, Byrd and Hickman (1992) find that tender offer bidders, with more NEDs sitting on the boards, experience a zero stock price return on average, compared to other bidders who suffer losses of 1.8% on average. In the case of takeover defense, Brickeley et al (1994) report that the market reaction is positive only if the firms have more independent NEDs sitting on the board. More importantly, some studies show that independent NEDs are effective monitors of the financial accounting process. Studies by Dechow et al (1996) and Beasley (1996) find that firms with few independent NEDs are more likely to commit financial fraud. Studies by Peasnell et al (2005) and Klein (2002) report that the proportion of NEDs sitting on the board is negatively associated with earnings management via accruals.

In the UK, the importance of NEDs has been emphasised by the Cadbury Report (1992)[10]. The report recommends a minimum of three NEDs on the board so that their views will carry significant weight in the board's decisions. The Higgs Report (2003) has further emphasised the importance of independent NEDs and recommends UK boards to have at least half of the board members to be independent NEDs. A few studies have investigated the relationship between the board of directors and institutional investors. Using 190 publicly-traded, bank-holding companies in the US, Whidbee (1997) finds that board composition is positively associated with IO but negatively associated with CEO ownership, indicating that NEDs are encouraged by institutional investors but decrease with DO. He argues that board composition is influenced by the ownership structure as CEO with higher ownership has more negotiation power on the number of NEDs sitting on the board. Bathala and Rao (1995) investigate the determinants of board composition under the hypothesis that individual firms choose their optimal board composition depending upon other alternative mechanisms employed by firms to control agency conflicts. Consistent with their hypothesis, their empirical results show an inverse relationship between board composition and directors' ownership, dividend payout, and debt leverage. Bathala and Rao (1995) also find a significant positive relationship between board composition and institutional ownership. Recently, Yang et al. (2006) have investigated the determinants of board composition

[10] The full name of this report is the Financial Aspects of Corporate Governance. It was sponsored by the Financial Reporting Council, the London Stock Exchange (LSE) and the accountancy profession.

of US firms. They find a negative association between the fraction of inside directors and IO, and argue that institutional investors are able to monitor managers' moral hazard and promote independent boards. Interestingly, although all above studies consider institutional ownership as a determinant of board composition, they have largely ignored the endogeneity problem between them. We will address this endogenous issue by using a simultaneous equation system. According to Fama and Jensen (1983), independent NEDs are central to the effective resolution of the agency problem between managers and shareholders. They are expected to act in the general interest of outside shareholders including institutional investors. As a result, institutional investors and NEDs are very likely to share the same interest in monitoring the management. This leads us to hypothesize:

Hypothesis 2*: The level of institutional shareholdings is positively associated with board composition, measured as the proportion of NEDs sitting on boards*.

2.4 Other Firm Specific Characteristics:

Several studies find that the effectiveness of the board of directors is influenced by its size. A large board tends to be less effective (Jensen 1993) as decision-making becomes slow-moving due to the involvement of more people and increasing communication and processing costs with growing board size (Lipton and Lorsch 1992). This is consistent with the empirical finding of a negative association between board size and firm performance by Yermack (1996) and Eisenberg et al (1998). Yang et al (2006) also find a negative association between board size and IO, indicating that IO promotes efficient boards. Since board size has a negative effect on board performance which in turn reduces firm performance and value, our model controls for the potential impact of board size on IO.

Under the legal environment of the US, the behaviour of institutional managers is subject to scrutiny under both the common law and Employee Retirement Income Security Act (ERISA)[11], which purport to protect the clients of institutional investors by allowing them to prosecute a

[11] ERISA (1974) set up federal minimum standards for employee benefit plans, including standards regulating the conduct of plan fiduciaries and trustees. The Act also established an insurance programme designed to guarantee workers receipt of pension benefits if their defined benefit pension plan should terminate.

custodian (fund manager) who fails to invest their money in their best interest. Fund managers are expected to behave in the manner of a 'prudent' person. What the courts accept as a prudent investment has been based primarily on the assets' characteristics in isolation but not on their roles in the overall portfolio. Consequently, institutional investors under this constraint have incentives to protect themselves from liability by tilting their portfolios toward those assets that are easy to defend in court, for example stocks with higher S&P ranking or better past financial performance. An early study by Badrinath et al. (1989) provides supporting evidence on the prudent-man law. They show that the level of institutional ownership is positively associated with firm size, past performance, company beta, trading liquidity, and listing history, and negatively associated with return volatility.

Cready (1994) finds that institutional investors invest more in larger firms, firms included in S&P 500 index, and firms with relatively low dividends. A study by Del Guercio (1996) finds that the above prudent-man law has the most significant impact on banks but the least on mutual funds. Using quarterly data from 1980 to 1996 in the US, Gompers and Metrick (2001) find the shareholding level of large institutional investors (with at least $100 million under management) is negatively related to firms' past performance. They offer two reasons for this finding. First, institutional investors are sophisticated investors who have better knowledge of the long term historical return patterns and are able to recognize exploitable anomalies. Second, institutional investors may have different preferences for risk and return and may believe that differences in historical returns across stocks are due to differences in risk. As a result, the evidence on the relation between past performance and IO appears to be mixed. Finally, Hussain (2000) finds that UK institutional investors prefer smaller firms and firms with lower DO. He also finds that firms in the utility sector have significantly higher IO than firms in other industry sectors.

To evaluate the potential impact of the above factors on the investment preference of institutional investors, this study also controls for firm size, past performance, leverage, dividend yield, book-to-market ratio, listing history, return volatility, trading liquidity, and company beta.

3. Methodology

3.1 Tobit Model

According to the London Stock Exchange, only investors owning more than 3% of total shares outstanding are required to be disclosed. As a result, we use a Tobit model to deal with the censored data. IO is set as zero if no individual institutional investor owns more than 3% of total shares outstanding. Under this model parameters are estimated by the maximum likelihood. Gompers and Metrick (1998) and Falkenstein (1996) have used this model to deal with the same issue in the US. According to SEC Rule 13-F, all institutions managing more than $100 million in equity must file a quarterly report listing all equity holdings that are greater than 10,000 shares or $200,000 in market value. However, both the above studies report results using the Tobit model and OLS are qualitatively identical. Besides 3% threshold, we also try other shareholding thresholds for robustness test purposes, including 5%, 10% and 20%. 5% is frequently used in previous studies (e.g. Agrawal and Mandelker, 1990) as a threshold to define blockholders and 20% is used as a threshold to define shareholders that have a controlling power in firms. Our Tobit model is shown as follows. The 10% threshold was chosen because it has been used by fund managers as a significant trigger point. Institutional investors' concern about certain firm characteristics may varies across different thresholds. Stapledon (1996) finds that at or above 10% of shareholdings fund managers stat to take a more active role in the corporate governance of their invested firms. For example, Black and Coffee (1994) report that Prudential Portfolio Managers Ltd. Becomes concerned about liquidity problem when ownership level reaches at 10% or above.

$$IO_{it} = a_0 + a_1 DO_{it} + a_2 BC_{it} + \sum_{j=1}^{j=n} a_{j+2} X_{ijt} + e \qquad (1)$$

where, IO_{it} denotes the aggregated *IO* for firm i for period t; DO_{it} denotes directors' ownership for firm i for period t; BC_{it} denotes board composition, measured by the proportion of NEDs sitting on the board; X_{ijt} is a vector of control variables j for firm i for period t, including firm size (FS), board size (BS), book-to-market ratio (BM), past ROA (ROA), dividend yield (DY), leverage (LEV), listing history (AGE), share return volatility (VOL), share turnover (LIQ), and

company beta (Beta). We predict that a_1 (a_2) is negative (positive) and significant if Hypothesis1 (Hypothesis 2) holds.

3.2 Non-linear Models

We also use the following models, suggested by McConnell and Servaes (1990) and Curcio (1994), to test for a potential non-linear relationship between DO and IO.

$$IO_{it} = a_0 + a_1 DO_{it} + a_2 DO_{it}^2 + a_3 BC_{it} + \sum_{j=1}^{j=n} a_{j+3} X_{ijt} + e \qquad (2)$$

where DO_{it}^2 is the square of DO_{it}; other variables are as defined in the Model (1). If the relation between *IO* and *DO* is negative and non-linear, then we will observe a positive and significant slope coefficient on DO^2.

We also use the following cubic model to detect the potential non-linear relation. Similar models have been used by Morck (1988) and Short and Keasey (1999).

$$IO_{it} = a_0 + a_1 DO_{it} + a_2 DO_{it}^2 + a_3 DO_{it}^3 + a_4 BC_{it} + \sum_{j=1}^{j=n} a_{j+4} X_{ijt} + e \qquad (3)$$

where DO_{it}^3 is the cubic term of DO_{it}; other variables are as defined in Models (1) and (2). If the relationship between *IO* and *DO* is negative and non-linear, we should observe a positive and significant slope coefficient for DO^2 and a negative and significant slope coefficient for DO^3.

3.3 Controlling for endogeneity: Simultaneous Equations

Anecdotal evidence (Bathala and Rao, 1995; Whidbee, 1997; Yang et al., 2006) suggests that IO affects both board composition and managerial shareholdings, but does not address the possibility that both internal control mechanisms may have an impact on IO. To investigate the potential

causality issue and for the purpose of robustness check, we also use the following simultaneous[12] models for a part of our sample. All the variables are as defined previously.

$$\textbf{Equation (1)}: IO = f(DO, BC, FS, BM, ROA, DY, LEV, AGE, VOL, LIQ, \textbf{Beta})$$
$$\textbf{Equation (2)}: DO = f(IO, BC, FS, BM, ROA, DY, LEV, AGE, VOL, \textbf{SG}) \quad (4)$$
$$\textbf{Equation (3)}: BC = f(IO, DO, FS, BM, ROA, DY, LEV, AGE, VOL, \textbf{NED})$$

where SG is sales growth and NED is the number of NEDs sitting on board.

Following the previous literature, Model (1) includes directors' shareholding, board composition, firm size, past accounting performance, dividend yield, leverage, listing history, share return volatility and trading liquidity as the explanatory variables for institutional ownership. Beta is used as the instrumental variable because firms' short-term market risk has significant affect on IO but is not directly related to *BC* and *DO*.

Model (2) includes institutional ownership, board composition, firm size, book-to-market ratio, past performance, dividend yield, leverage, and listing history as the explanatory variables for directors' ownership. Following Demsetz and Lehn (1985), we take the view that managers choose their shareholding to strike a balance between the control benefits and the disadvantages of holding an undiversified portfolio. Sales growth expands the asset base under management control, thereby giving rise to greater control payoffs. In this regard, sales growth is positively correlated with *DO* but is not correlated with *IO* and *BC*.

Model (3) includes institutional and directors' ownership, board size, book-to-market ratio, past performance, dividend yield, leverage, and listing history as the explanatory variables for board composition. We include board size instead of firm size in the model because they are highly correlated. Results using both measures are, however, qualitatively identical. We use the number of NEDs as the instrument variable because it is correlated with BC but not with *IO* or *DO*.

[12] This system is estimated using 3SLS method rather than 2SLS because the former allows for possible correlation between error terms across equations and hence is more efficient than the latter in large sample testing.

4. Data and Descriptive Statistics

Our study looks at the firms which were included in the FTSE All Shares Index during the years 1996, 1999 and 2003. The index included 822, 803, and 699 firms in 1996, 1999, and 2003 respectively. The total market value of these companies is approximately 90% of the market value of all the shares listed on the London Stock Exchange. We then remove investment trusts (closed end funds) from the sample and are left with 674, 577, and 569 firms for 1996, 1999, and 2003, respectively. Our sample does not suffer from survivorship bias because it includes all the active and dead firms. The choice of the above three years is mainly due to the introduction of the new financial act in 1997. According to this FA97, tax exemption on dividend income for pension funds was abolished in 1997. However, it was not until 1999 that this act took effect on other institutional investors such as insurance companies and charities. To control for the potential effect of this Act on institutional investments, our test period covers the pre-FA97 period (i.e.1996), the transition year (i.e.1999), and the post-FA97 period (i.e. 2003).

IO and DO data was hand collected from the Company REFS CDs. Company REFS release quarterly CDs every year. They are released in February, May, August and November except that 1997 had its first CD released in January 1997. We collected the data from the closest issue following company year end. For example, ownership data for the 1996 sample with December year end was collected from the Company REFS issue released in January 1997. For the 1999 sample with December year end, ownership data was collected from the Company REFS CDs released in February 2000; etc. Figure 1 shows the proportion of firms with various levels of IO in our sample.

[Insert Figure 1]

The figure shows that more companies have IO around 30% but most of our sample firms have IO between 10% and 50%. Very few firms have IO above 80%. IO has been slightly increasing over the test period (around 23%, 27%, and 31% of our total sample firms in 1996, 1999, and 2003, respectively).

Both DO and BC were also hand collected from the Company REFS CDs. The board composition is measured by the proportion of NEDs sitting on the board. Firms' listing history was collected from the London Share Price Database (LSPD). Other data including dividend yield, share price, book-to-market ratio, total asset and market capitalization are all downloaded from Datastream. Share return volatility and share turnover are calculated using share price, trading volume, and total outstanding shares downloaded from Datastream.

The distribution of DO is shown in Figure 2. It shows that DO does not change much in all three years with most of the firms having DO below 10%. About 80% of our sample firms have DO of approximately 10%; less than 10% of our sample firms have DO of approximately 20%. Very few firms have DO above 40%. This finding suggests that UK firms generally have very low DO. Short and Keasey (1999) argue that UK firms are more likely to become entrenched at a higher level of DO than their US counterparts due to stricter internal control mechanisms and a lack of takeover defence mechanisms.

[Insert Figure 2]

Figure 3 reports the distributions of BC. The distributions appear to be somewhat different in all three years. Most of the firms have boards with a proportion of NEDs to be anywhere between 30% and 80%. Less than 35% of firms have BC around 50% (40%) in 1999 and 2003 (1996), indicating BC has increased in the later years. UK firms appear to have increased the proportion of NEDs to 50% or above before the official recommendation from the Higgs Report (2003) became effective. However, we still observe a significant number of firms with BC below 50% in all three years.

[Insert Figure 3]

Table 1 provides descriptive statistics for all the variables examined in this study. We winsorize the extreme variables at the bottom and top percentile of individual distributions to reduce the impact of these outliers. We also transform some variables, such as market capitalisation and board size using the natural log.

Consistent with the finding in Figure 1, the average IO has increased slightly from 26% in 1996 and 1999 to 28% in 2003 (the difference is significant at the 5% level). The average DO increases from 7% in 1996 to 8% in 1999, and then decreases to 6% in 2003. The average DO appears to be lower than the sample average during 1988-1992 in Short and Keasey (1999). The decrease in average DO between 1999 and 2003 is significant at the 1% level. Interestingly, the proportion of NEDs (BC) has increased from 47% in 1996 to 49% and 54% in 1999 and 2003 respectively. This suggests that during our sample years, there is a positive association between IO and BC and a negative association between IO and DO. Both are consistent with our Hypotheses 1 and 2. The increasing board composition suggests that UK firms are hiring more NEDs sitting on the board, which is consistent with the findings of Young (2000). Surprisingly, the median of BC appears to be above 50% in all three years, which is consistent with the recent board revolution recommended by the Higgs Report (2003). This suggests that many UK firms had already adopted the Higgs Report before it actually became effective. The average board size slightly decreases from 8.52 in 1996 to 8.49 in 1999 but increases to 8.6 in 2003. The differences are however insignificant. The median board size for all three years remains around 8 directors.

Stock market capitalization also exhibits an increasing tendency. The average market capitalisation increases from £1.16 billion in 1996 to £1.83 billion in 1999 and to £2.26 billion in 2003, which is almost doubled in 1996 (the difference is significant at the 1% level). The average book-to-market ratio is 56% for both 1996 and 1999 and increases to 62% in 2003 (the difference is significant at the 1% level). Both the mean and median past ROA are not stable (mean ROA ranges from 10% to 14%; median ROA ranges from 9% to 14%). 1999 has the highest mean and median ROA of 14%. Both the mean (ranges from 34% to 40%) and median (ranges from 21% to 24%) leverage ratios suggest that our sample firms show relatively lower gearing.

The average dividend yield is 4.15% in 1996 and 2.69% in both 1999 and 2003 (the differences between 1996 and 1999, and 1996 and 2003 are significant at the 1% level) although the median dividend yield remains at 3% in all three years. The above decrease in the average dividend yield could be caused by the FA97 and the practice of share repurchases starting from the mid 1990s. Before the FA97, pension funds and insurance companies were exempt from dividend income tax. According to the tax clientele theory, these companies should have investment preference for

firms with a higher DY before 1997. To attract and satisfy these investors, firms might have deliberately distributed higher dividends. However, as the tax exemption on pension funds and insurance companies was formally abolished after 1997 and 1999 respectively, the high dividend payout policy may become unattractive to these institutional investors anymore. On the other hand, share repurchases[13] have become more popular since the mid 1990s in the UK, which might have further reduced the dividend payout.

The average listing ages are 15.86, 16.27, and 17.67 years for 1996, 1999, and 2003 respectively, and the median listing age ranges from 10 to 11 years. The volatility of share returns increased from 7% in 1996 to about 12% in 2003 whereas the liquidity increased from 8% in 1996 to 14% in 1999 and then dropped to 10% in 2003. The increasing beta values from 1996 to 2003 suggest that the average systematic risk attached to FTSE All Shares Index firms increased over the period of study. Sales growth for 2003 has a high average (1.78) but a small median (0.05), indicating that our sample contains extremely high growth firms. The average number of NEDs sitting on boards is 4.7 in 2003, with a minimum of 0 and a maximum of 12.

[Insert Table 1]

Table 2 reports the correlation analyses. We find that IO is negatively correlated with DO, FS, and BS in all three years. This is consistent with previous studies (Bathala et al., 1994; Chen and Steiner, 1999; Hussain, 2000) in the sense that IO is a substitute control mechanism for DO. We find that UK institutional investors prefer smaller boards and firms. This finding is different from most of the US studies but consistent with Hussain (2000) and Bennett et al. (2003). Moreover, consistent with previous studies (Bathala and Rao, 1995; Whidbee, 1997; Yang et al., 2006), we find a positive correlation between IO and BC, indicating that board composition is a complementary control mechanism for IO. Although IO is negatively correlated with the dividend yield in all three years, the correlation coefficient is significant only in 2003, indicating that the impact of FA97 on institutional investors exists but appears to be delayed due to the abolishment of tax exemption on other institutional investors than pension funds was taken into effect in 1999. We further investigate this issue in the next section. IO appears to be negatively

[13] Share repurchase was legalized in 1981 in the UK and its first announcement was in 1983.

correlated with AGE in all three year although the correlation coefficients are only significant in 1999 and 2003, indicating that institutional investors generally prefer firms with a shorter listing history. Surprisingly, IO is never correlated with BM, past ROA, and LEV. DO is negatively correlated with board composition, firm size, dividend yield, listing age, and board size in all three years. Consistent with previous studies, we find that directors' ownership is high when firms have weaker (Lasfer, 2006) and smaller boards (Yang et al, 2006). Firms that are smaller and have a shorter listing history may have more serious agency problem, which can be reduced through higher DO. Dividend yield is negatively correlated with DO in all three years.

We also find that board composition is positively correlated with firm size in all three years, positively correlated with leverage in 1996 and 1999, and negatively correlated with listing age in 1996 and 2003. The latter finding suggests that firms with a shorter listing history have more NEDs sitting on the board. Board size is positively correlated with firm size in all three years, and positively correlated with dividend yield in 1999 and 2003. Number of NEDs sitting on the board is positively correlated with board composition and firm size in 2003.

[Insert Table 2]

5. Results

5.1 Tobit Model

Table 3 reports the results using the Tobit model. We partition IO into four groups. They are the groups with IO thresholds greater than 3%, 5%, 10%, and 20% respectively. IO is consistently negatively associated with DO in all the cases although the coefficients for IO above 10% threshold are insignificant in 1999. This is generally consistent with our Hypothesis 1 that UK institutional investors prefer firms with lower directors' ownership.

We find that IO is positively associated with BC in all the cases. This is consistent with our Hypothesis 2 that UK institutional investors prefer firms with higher proportion of NEDs sitting

on the board. However, one may argue that institutional investors are influential players who can persuade their invested firms to adopt a more independent board and have more NEDs sitting on board. In other words, there may be a causality problem between IO and BC. We address this issue in the next section.

IO is negatively associated with firm size in all the cases although the coefficients are only significant when the IO thresholds are less than 10%. This finding is opposite to the findings of most of the US studies (Badrinath et al., 1989; Cready, 1994, Del Guercio, 1996; and Falkenstein, 1996), but consistent with the studies by Hussain (2000) in the UK and Bennett et al. (2003) in the US. The latter study finds that although institutional investors still show an overall preference for large stocks, they have become much more willing to hold smaller, riskier stocks over the past decade due to two reasons. First, an institutional demand shock[14] combined with institutional investors' preference for larger-capitalisation stocks have over-priced most of these shares over time. Institutional investors therefore have to move to "less expensive" smaller stocks. Second, as informed investors, institutional investors have greater informational advantages in smaller-capitalisation stocks than other uninformed or less informed investors. Demsetz and Lehn (1985) argue that due to ownership concentration one may expect to observe a negative association between IO and firm size due to two size effects. First, assuming shareholders are risk neutral investors (the "risk neutral effect"), it costs them more to acquire an additional fraction of ownership in larger firms. Consequently larger companies normally have a greater diffusion of external ownership. Second, assuming shareholders are risk averse investors (the "risk aversion effect"), they only purchase additional shares at lower, risk-compensating prices. This increases the cost of raising capital and discourages managers of larger firms from maintaining highly concentrated ownership. Taking the risk neutral and aversion effects together, firms with a large size are more costly to be controlled and consequently attract less IO than smaller firms. Demsetz and Lehn (1985) find a negative relation between market capitalization, the Herfindahl concentration index and the aggregate ownership of the largest 5 or 20 blockholders.

[14] Institutional Demand Shock refers to the dramatic influence of institutional buyings on stock price. Gompers and Metrick (2001) find that the raw level of institutional ownership is positively related to future stock returns. They hypothesize that stocks which currently have higher institutional ownership would experience more institutional buying in the future as the institutional share of the market grows. When demand elasticity is finite, such demand shocks drive up prices and lead to higher returns for stocks that institutions prefer.

The association between IO and book-to-market ratio is less clear cut. We find that UK institutional investors seem to prefer firms with high book-to-market ratio (value stocks) in 1996 and 1999, but appear to switch to firms with low book-to-market ratio (growth stocks) in 2003. This finding may be caused by the drop in market value after 1999 due the burst of ".com" bubbles in the UK. It may also imply that institutional investors invest in both growth and value stocks. Lakonishok et al. (1994) find that US institutional investors prefer growth to value stocks. They hypothesize that previous success of these stocks helps institutional investors to justify their portfolios to their investors, and also the herding behaviour among institutional investors may lead to their investments being biased towards these stocks. However, Fama and French (1992) find high book-to-market stocks are riskier. Institutional investors usually invest in well-diversified portfolios which include both growth and value stocks.

The association between past ROA and IO is also less clear cut. Some evidence indicates a negative association between them in 1996 and 1999. This is different from the "Prudent Man" rule that institutional investors prefer to invest in companies with good past financial performance. Previous US studies, however, have provided mixed evidence on the relationship between institutional ownership and firms' historical performance. For instance, Cohen et al. (2002) find that institutional investors tend to buy stocks after market declines and sell stock after the market goes up. Gompers and Metrick (2001) find IO is negatively associated with firms' historical performance. Many studies, however, have provided evidence consistent with the "Prudent Man" rule that institutional investors prefer firms with good past performance. Unlike the 'prudent-man' law in the US, the equivalent legal constraint was not present in the UK[15] until after the introduction of the Myner's Report in 2001. Our results from the 2003 sample may shed some light on the impact of this new development on the investment behaviour of UK institutional investors. IO appears to be positively associated with past ROA in all the cases, although all the coefficients for the IO thresholds greater than 3% are insignificant. This weak result could be caused by the fact that institutional investors with larger stakes may not be able to

[15] In the *Pensions Security Act 1993* and *Pensions Act 1995*, pension trustees in the UK are bound to a similar 'prudent man' constrains. However they are only required to exercise reasonable care and to show the prudence and diligence that an ordinary man of business would in the exercise of his own affairs, which is different from the experts' prudence in the US.

alter their investment portfolios quickly enough to reflect their compliance with the Myners' Report.

Dividend yield is an important issue for institutional investors. Our result shows that IO is negatively associated with DY for all the years. But the coefficients are only significant when the IO threshold is above 20%[16] in1996 and 1999. Interestingly, IO is negatively associated with DY in all the levels of shareholdings in 2003. Our finding generally supports the tax clientele theory in the sense that block institutional investors usually have long-term investment strategies in their invested firms and prefer to be taxed on capital gains rather than dividend income. This is because the tax rate for capital gains is lower than that for dividends and the tax claimed on capital gains is deferred until the gains are realised. Institutional investors generally try to avoid high dividend payout as it may reduce firms' future earning. We also find no significant aversion to high DY stocks when their shareholding is below 20% in both 1996 and 1999 samples. There are three possible explanations for this finding. First, smaller institutional investors focused on balancing their portfolios and were unable to adjust their portfolios quickly enough to respond to the FA97. Second, according to Bell and Jenkinson (2001), pension funds were likely to prefer high DY stocks in the UK before 1997 due to the tax exemption on dividend income. Finally, according to the survey "Share Ownership" (2003) [17], the overall shareholding of UK pension funds decreased to less than 20% in 1999 because pension funds have shifted away from the equities market and invested more in the bond market after the FA97. Our results for 2003, however, indicate a strong switch to low dividend payout policies, which is apparently caused by the abolishment of tax exemption on dividend income that was introduced by the FA97.

Jensen and Meckling (1976) argue that debt reduces agency costs by monitoring managerial moral hazard. Hence, highly geared firms may demand less of other external monitoring mechanisms such as IO. Bathala et al. (1994) find a negative association between leverage and IO.

[16] We checked the identity of these largest institutional blockholders. We found that only 1 pension fund and 2 life assurance companies (out of 118) have above 20% ownership in 1996 and only 1 life assurance company has above 20% ownership in 1999.

[17] A report on ownership of shares (31st December 2003, HMSO) mentions that Pension funds' switch from equity market to bond market has been affected by various factors such as changes in regulation and accounting standards, the introduction of Stakeholder Pensions and a continuation of the movement away from defined benefit to defined contribution schemes. Different tax exposure between equity investment and bond might be one reason as well because pension fund can get tax exemption in certain bond investments.

We, however, find a less clear cut result indicating that although IO above 20% is negatively associated with LEV in all three years, the coefficient is only significant in 1999. In addition, IO of less than 10% is positively associated with LEV, although only in the 1996 sample.

Firms with a long listing history in the stock exchange are found to be more popular with institutional investors in the US. Table 3, however, shows that UK institutional investors had switched to firms with shorter listing history in the London Stock Exchange in 1999 and 2003.

We find IO is negatively associated with share return volatility in all cases, although only the coefficients for IO above 10% in 1996 are significant. This finding is generally consistent with previous studies (Badrinath et al., 1989; Barucci, 2005).

Table 3 also shows consistent evidence on a negative association between IO and share liquidity, especially in 2003. This finding is contradictory to the evidence from most of the previous studies. The negative association between IO and liquidity could be caused by the following two reasons. First, pension funds and insurance companies [18], which do not trade as frequently as banks, mutual funds etc., dominate the total institutional investments in the UK. According to 'Share Ownership' (2003), pension funds contribute about 78 % of the total institutional investments in 1996, 74% in 1999 and 63% in 2003 in the UK. Second, we find UK institutional investors prefer smaller firms that normally have lower share turnover than larger firms. This finding suggests that investment preferences of institutional investors vary across borders. Finally, consistent with the previous studies, IO is positively associated with Beta in all the cases, although not all the coefficients are significant.

[Insert Table 3]

5.2 Nonlinear Models

[18] O'Barr and Conley (1992) and Black (1992), suggest that the trading behaviour of pension funds and insurance companies differs from other institutions because of the relatively longer-term horizon of the pension beneficiaries. Differences in trading patterns between pensions and other institutions may also stem from tax incentives for trading on returns performance which is limited for pension funds relative to those for other types of institutions.

The regression results using the quadratic model (2) and cubic model (3) are reported in table 4. We find the cubic model fits our data better than the quadratic model in all three years (in terms of higher Pseudo R-squared values). The coefficients of *DO* are significantly negative in all three years when using both models (2) and (3); the coefficients of DO^2 are significantly positive in all three years when using the model (3); and the coefficients of DO^3 are significantly negative in all three years when using the model (3). In summary, the above results indicate that *IO* is negatively associated with *DO* but this association changes as the level of *DO* reaches certain levels. This is somehow similar to the nonlinear relation between firms' value and directors' ownership found by Morck et al. (1988) that firm value increases when management ownership is below 5% and greater than 25% and then decreases when management ownership ranges between 5% and 25%. Table 4 also shows that BC (FS) is positively (negatively) associated with IO in all the cases, which supports our hypotheses 1 and 2. Results for BM, ROA, DY, LEV, AGE, VOL and LIQ are generally consistent with those reported in Table 3.

[Insert Table 4]

To further investigate the nonlinear relationship between IO and DO, we simplify model (3) and use simulation data to provide the plots of the following three equations in Figure 4.

$$y = \begin{cases} 0.78 - 4.04x + 9.84x^2 - 9.60x^3 if\ (x, y) \in Firms\ 1996 \\ 0.84 - 2.14x + 6.12x^2 - 6.48x^3 if\ (x, y) \in Firms\ 1999 \\ 0.90 - 2.03x + 9.50x^2 - 17.88x^3 if\ (x, y) \in Firms\ 2003 \end{cases}$$

where y and x indicate IO and DO, respectively. The constants, 0.78, 0.84 and 0.90, are the maximum IOs in 1996, 1999 and 2003, respectively.

[Insert Figure 4]

Figure 4 shows that in all three years IO is negatively associated with DO. IO decreases more rapidly when DO is below 20% or above 40% than when IO is between 20% and 40%. This

indicates institutional ownership is significantly reduced in firms with potential agency problems (relatively small DO) and management entrenchment problems (relatively large DO).

5.3 Simultaneous Equations

As mentioned earlier, we also use three-stage least squares (3SLS) simultaneous equations (model 4) to deal with the potential endogeneity issue between IO, DO, and BC. We only report the results using the 2003 sample firms because the results for 1996 and 1999 are qualitatively consistent. Table 5 shows that, consistent with the results reported in Tables 3 and 4, IO is positively associated with BC but negatively associated with DO, FS, and DY. Regarding the instrumental variables, market Beta (Beta) is positively associated with IO; sale's growth (SG) is positively associated with DO and the number of NEDs sitting on boards is positively associated with board composition. We also find that DO is negatively associated with BC, FS, and DY, but is positively associated with past ROA. BC is negatively associated with FS.

[Insert Table 5]

6. Sensitivity Tests

Besides the measurement of firm size used in the Tobit model, we also use total assets as an alternative proxy for size and find consistent results, indicating that our finding of a negative association between IO and FS is not sensitive to different measures of firm size.

In an unreported test, we use past ROE instead of ROA as an alternative proxy for firms' performance. It provides very similar results, indicating that our finding is not sensitive to different measures of past financial performance.

Since 336 firms (out of 902 firms) appear in both 1996 and 2003, we have to control for fixed firm effects to mitigate the fixed differences over times that vary only by firms. The unreported results shows that changes in IO is negatively associated with changes in DO, DY and FS, but is

positively associated with changes in BC. We also control for the industry effect and the results are robust.

7. Conclusions and Future Research

This study examines the extent to which directors' ownership and board composition, measured by the proportion of NEDs sitting on the board, affect the level of institutional shareholding in UK firms. We find that institutional shareholdings are positively associated with board composition, but negatively associated with directors' ownership. This finding implies that directors' ownership is perceived by UK institutional investors as a substitute mechanism and board composition is perceived by institutional investors as a complementary mechanism. This finding is robust even after controlling for the potential endogeneity problem and the fixed firm and industry effects. We provide evidence of a nonlinear relationship between institutional and directors' ownerships. In addition, institutional ownership is negatively associated with dividend yield for all the ownership thresholds in 2003, indicating that the introduction of the Financial Act 1997, which abolished the tax exemption on dividend income, has significantly changed the investment preference of UK institutional investors. This study also provides evidence that UK institutional investors generally prefer smaller firms and firms with smaller boards, lower share turnover, and shorter listing history in the London Stock Exchange.

However, this study does not intend to investigate whether investment preference is conditional on different types of institutional investors because most institutional investors engage in various businesses, which makes a classification difficult. We find that some UK 'banks' have engaged in banking, insurance, mutual, and pension funds. Previous studies by Del Guercio (1996), Ersoy-Bozcuk and Lasfer (2001) and Nielson (2004) have documented that institutional investors are heterogeneous in nature and may have different investment preferences. For example, insurance companies, banks, pension funds, investment banks, mutual funds may have very different investment horizons, trading strategies, and legal regulations. We believe this deserves to be separately examined in future research.

References

Agrawal, A. and Mandelker, G.N., 1990, "Large Shareholders and the Monitoring of Managers: the case of anti-takeover charter amendments," *Journal of Financial and Quantitative Analysis*, Vol. 31, Issue 3(September), 143-161.

Ajinkya, B., S. Bhojraj, and P. Sengupta, 2003, "The Governance Role of Institutional Investors and Outsider Directors on the Properties of Management Earnings Forecasts," University of Florida Working Paper.

Badrinath, S.G., G. Gerald, and K. Jayant, 1989, "Patterns of Institutional Investment, Prudence, and the Managerial 'Safety-net' Hypothesis," *Journal of Risk and Insurance* 56, 605-629.

Badrinath, S.G., J. R. Kale, and H.E. Ryan, 1996, "Characteristics of Common Stock Holdings of Insurance Companies," *Journal of Risk and Insurance* 63, 49-76.

Barucci, E. (2005), "Institutional investors and Corporate Governance in Italy: an Analysis of Their Stockholdings," Università degli Studi di Pisa Working Paper.

Bathala, C.T., K.P Moon, and R.P. Rao, 1994, "Managerial Ownership, Debt Policy, and the Impact of Institutional Holdings: An Agency Perspective," *Financial Management* 23, 38-50.

Bathala, C.T. and R.P Rao, 1995, "The Determinants of Board Composition: An Agency Theory Perspective," *Managerial and Decision Economics* 16, 59-69.

Beasley, M., 1996, "An Empirical Analysis of the Relation between Board of Directors' Composition and Financial Statement Fraud," *The Accounting Review* 71, 443-465.

Bell, L., and T. Jenkinson, 2001, "New Evidence of the Impact of Dividend Taxation and on the Identity of the Marginal Investor," *Journal of Finance* 57, 1321-1346.

Bennett, J. A., R.W. Sias, and L.T. Starks, 2003, "Greener Pasture and the Impact of Dynamic Institutional Preferences," *The Review of Financial Studies* 16, 1203-1238.

Bhagat, S., and B. Black, 1999, "The Uncertain Relationship between Board Composition and Firm Performance', *Business Lawyer* 54, 921-63.

Black, B. S., 1992, "Agents Watching Agents: the Promise of Institutional Investors' Voice," *UCLA Law Review*, 39: 811-893.

Black, B.S. and Coffee Jr., J.C., 1994, "Hail Britannia? Institutional Investor Behaviour under Limited Regulation," *Michigan Law Review*, Vol. 92, Issue 7(Jun), 1997-2087.

Brickeley, J., J. Coles, and R. Terry, 1994, "Outside Directors and Adoption of Poison Pills," *Journal of Financial Economics* 35, 371-390.

Byrd, J., and K. Hickman, 1992, "Do Outside Directors Minor Managers: Evidence from Tender Offer Bids," *Journal of Financial Economics* 32, 195-207.

Cadbury, Sir A., 1992, *Report of the Committee on the Financial Aspect of Corporate Governance*, London.

Chen, C. R., T.L. Steiner, 1999, "Managerial Ownership and Agency Conflicts: A Nonlinear Simultaneous Equation Analysis of Managerial Ownership, Risk Trading, Debt Policy, and Dividend Policy," *The Financial Review* 34, 119-136.

Cohen, R. B., P.A. Gompers, and T. Vuolteenaho, 2002, "Who Underreacts to Cash-flow News? Evidence from Trading between Individuals and Institutions," *Journal of Financial Economics* 66, 409-462.

Coombes, P., and M. Watson, 2000, "Three Surveys on Corporate Governance," *The Mckinsey Quarterly Special Ed.* (No. 4), 74-77.

Cotter J.F., A. Shivdasani, and M. Zenner, 1997, "Do Independent Directors Enhance Target Shareholder Wealth during Tender Offers?" *Journal of Financial Economics* 43, 195–218.

Cready, W. 1994, "Determinants of Relative Investor Demand for Common Stocks: Professional Adaptation," *Journal of Accounting, Auditing, & Finance* 9, 487-509.

Curcio, R., 1994, "The Effect of Managerial Ownership of Shares and Voting Concentration on Performance," London School of Economics. Working Paper 185.

Dechow, P., R. Sloan, and A. Sweeney, 1996, "Causes and Consequences of Earnings Manipulation: an Analysis of Firms Subject to Enforcement Actions by the SEC," *Contemporary Accounting Research* 13, 1-36.

Del Guercio, D., 1996, "The Distorting Effect of the Prudent-Man Laws on Institutional Equity Investment," *Journal of Financial Economics* 40, 31-62.

Demsetz, H., and L. Kenneth L., 1985, "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy* 93, 1155-1177.

Doidge, C., A. Karolyi, and R. Stulz, 2005, "Why do Countries Matter so much for Corporate Governance?" Ohio State University Working Paper.

Eisenberg, T., S. Sundgren, and M. Wells, 1998, "Larger Board Size and Decreasing Firm Value in Small Firms," *Journal of Financial Economics* 48, 35-54.

Ersoy-Bozcuk, A. and M.A. Lasfer, 2001, "Changes in Shareholder Groups' Holdings and Corporate Monitoring: the UK Evidence," City University Business School Working Paper.

Falkenstein, E., 1996, "Preferences for Stock Characteristics as Revealed by Mutual Fund Portfolio Holdings," *Journal of Finance* 51, 111-135.

Fama, E. F., and M.C. Jensen, 1983, "Separation of Ownership and Control," *Journal of Law and Economy* 26, 301-325.

Fama, E. F., and K.R. French, 1992, "The Cross-section of Expected Stock Returns," *Journal of Finance* 47, 427-466.

Ferreira, M. and P. Matos, 2006, "The Colors of Investors' Money: Which Firms Attract Institutional Investors from around the World?" University of South Carolina Working Paper.

FTSE Company, 2004, *Ground Rules for the Management of the UK Series of the FTSE Actuaries Share Indices*.

Gillan, S. L., and L.T. Starks, 2003, "Corporate Governance, Corporate Ownership, and the Role of Institutional Investors: a Global Perspective," *Journal of Applied Finance* 13, 4-22.

Gillan, S. L., J.C. Hartzell, and L.T. Starks, 2006, "Explaining Corporate Governance: Boards, Bylaws, Charter and State Provisions," Arizona State University Working Paper.

Gompers, P. and A. Metrick, 1998, "How Are Large Institutions Different from Other Investors? Why Do These Differences Matter?" Harvard Institute of Economic Research Working Paper.

Gompers, P. and A. Metrick, 2001, "Institutional Investors and Equity Prices," *Quarterly Journal of Economics* 116, 229-259.

Hartzell, J. and L.T. Starks, 2003, "Institutional Investors and Executive Compensation", *Journal of Finance* 58, 2351-2374.

Holland, J., 1999, "Financial Reporting, Private Disclosure and the Corporate Governance Role of Financial Institutions," *Journal of Management & Governance* 3, 161-187.

Higgs, D., 2003, *Review of the Role and Effectiveness of Non-executive Directors*, Department of Trade and Industry, London: UK Government.

Hussain, S., 2000, "Simultaneous Determination of UK Analyst Following and Institutional Ownership," *Accounting and Business Research* 30, 111-124.

Jensen, M.C. and W.H. Meckling, 1976, "Theory of the Firm: Managerial Behaviour, Agency Cost and Ownership Structure," *Journal of Financial Economics* 3, 305-360.

Jensen, M. C., 1993, "Presidential Address: the Modern Industrial Revolution, Exit and the Failure of Internal Control Systems," *Journal of Finance* 48, 831-880.

Klein, K., 2002, "Audit Committee, Board of Director Characteristics, and Earnings Management", *Journal of Accounting and Economics* 33, 375-400.

Lasfer, M.A., 2006, "The Interrelationship between Managerial Ownership and Board Structure", *Journal of Business Finance and Accounting* 33, 1006-1033.

Lakonishok, J., A. Shleifer, R. Thaler, and R. Vishny, 1991, "Window Dressing by Pension Fund Managers," *American Economic Review* 81, 227-231.

Lakonishok, J., A. Shleifer, and R. Vishny, 1992, "The Impact of Institutional Trading on Stock Prices", *Journal of Financial Economics* 32, 23-43.

Lakonishok, J., A. Shleifer, and R. Vishny, 1994, "Constrain Investment, Extrapolation, and Risk," *Journal of Finance* 49, 1541-1578.

Lipton, M., and J.W. Lorsch, 1992, "A modest proposal for improved corporate governance," *The Business Lawyer* 48, 59-77.

Mallin, C., 1995, "Voting and Institutional Investors," *Accountancy* 116, 76.

Mallin, C., 1999, "Financial Institutions and Their Relations with Corporate Boards," *Corporate Governance* 7, 248-255.

McConnell, J.J. and H. Servaes, 1990, "Additional Evidence on Equity Ownership and Corporate Value," *Journal of Financial Economics* 27, 595-612.

Morck, R., A. Shleifer, and R. Vishny, 1988, "Management Ownership and Market Valuation," *Journal of Financial Economics* 20, 293-315.

Myner, P., 2001, "Institutional Investment in the United Kingdom: A Review," Report to HM Treasury.

National Statistics Office, 2003, *UK Standard Industry Classification of Economic Activities*.

Nielsen, K., 2004, "Institutional Investors and the Market for Corporate Equity," University of Copenhagen Working Paper.

Nofsinger, J., and R. Sias, 1999, "Herding and Feedback Trading by Institutional and Individual Investors," *Journal of Finance* 54, 2263-2295.

O'Barr, M. W., and Conley, J. M., 1992, "Fortune and Folly: The Wealth and Power of Institutional Investors," Homewood, Business One Irwin.

Peasnell, K., P. Pope, and S. Young, 2005, "Board Monitoring and Earnings Management: Do NEDs Influence Abnormal Accruals?' *Journal of Business Finance and Accounting*, 32, 1311-1346.

Ramsay, I., G. Stapleton, and K. Fong, 1998 "Corporate Governance: The Perspective of Australian Institutional Shareholders", University of Melbourne Working Paper.

Rosenstein, S., and J.G. Wyatt, J.G., 1990, "NEDs, Board Independence and shareholder Wealth," *Journal of Financial Economics* 26, 175-191.

Shleifer, A and R. Vishny, 1986, "Large Shareholders and Corporate Control," *Journal of Political Economy* 94, 461- 488.

Short, H. and K. Keasey, 1999, "Managerial ownership and the Performance of Firms: Evidence from the UK," *Journal of Corporate Finance* 5, 79-101.

Stapledon, G. P., 1996, *Institutional Shareholders and Corporate Governance*, Oxford: Clarendon Press.

Stulz, R., 2005, "The Limits of Financial Globalization," *Journal of Finance* 60, 1595-1638.

Trades Union Congress (TUC) and the Ashridge Centre for Business in Society (ACBAS), 2003, "Will UK Pension Funds Become More Responsible?" *Just Pensions*, January.

Useem, M.E., J.M. Bowman, and C. Irvine, 1993, "US Institutional Investors Look at Corporate Governance in the 1990's," *European Management Journal* 2, 175-189.

Weisbach, M.S., 1988, "NEDs and CEO Turnover," *Journal of Financial Economics* 20, 431-460.

Whidbee, D.A., 1997, "Board Composition and Control of Shareholder Voting Rights in the Banking Industry," *Financial Management* 26, 27 – 41.

Yang, T., J.S. Linck, and J.M. Netter, 2006, "A Large Sample Study on Board Changes and Determinants of Board Composition," University of Georgia Working Paper.

Yermack, D., 1996, "Higher Market Valuation of Companies with a Small Board of Directors," *Journal of Financial Economics* 40, 185-211.

Young, S., 2000, "The Increasing Use of Non-executive Directors: Its Impacts on UK BC and Governance Arrangement," *Journal of Business Finance and Accounting* 27, 1311-1342.

Figure 1: Percentage of Sample Firms with Various Levels of IO

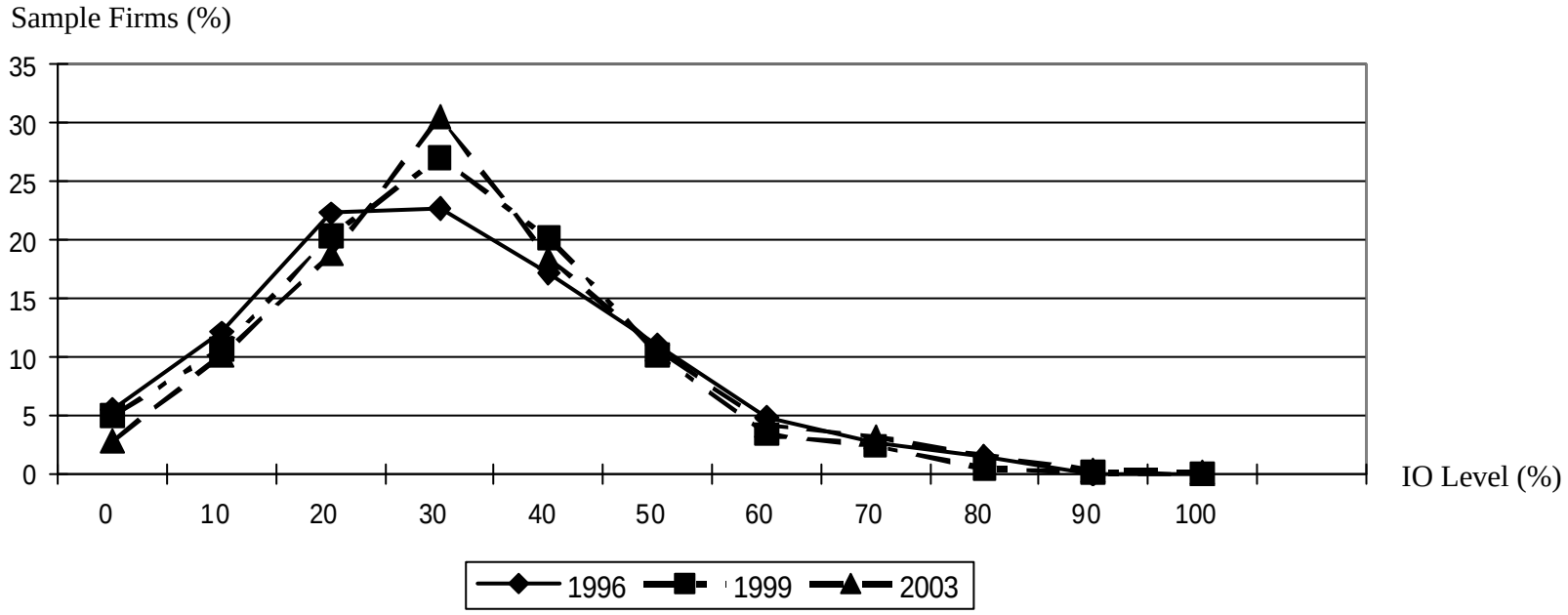

Figure 2: Percentage of Sample Firms with Various Levels of DO

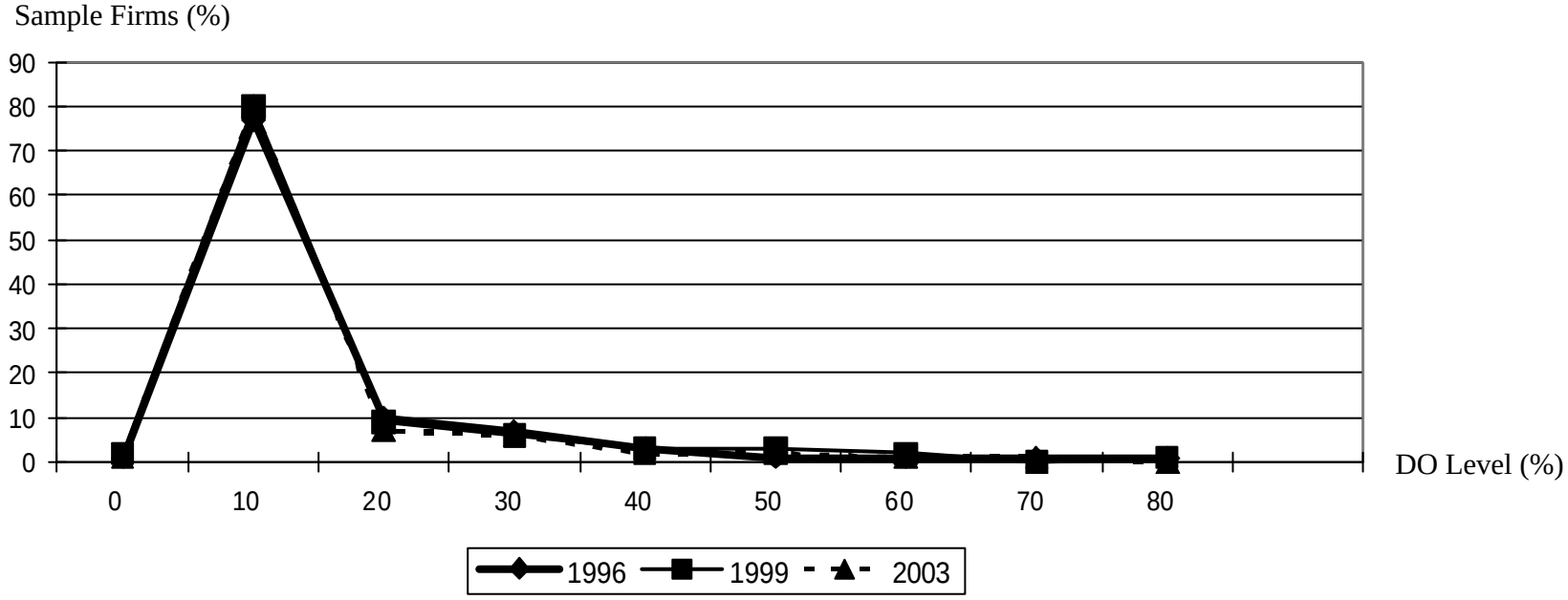

Figure 3: Percentage of Sample Firms with Various Levels of BC

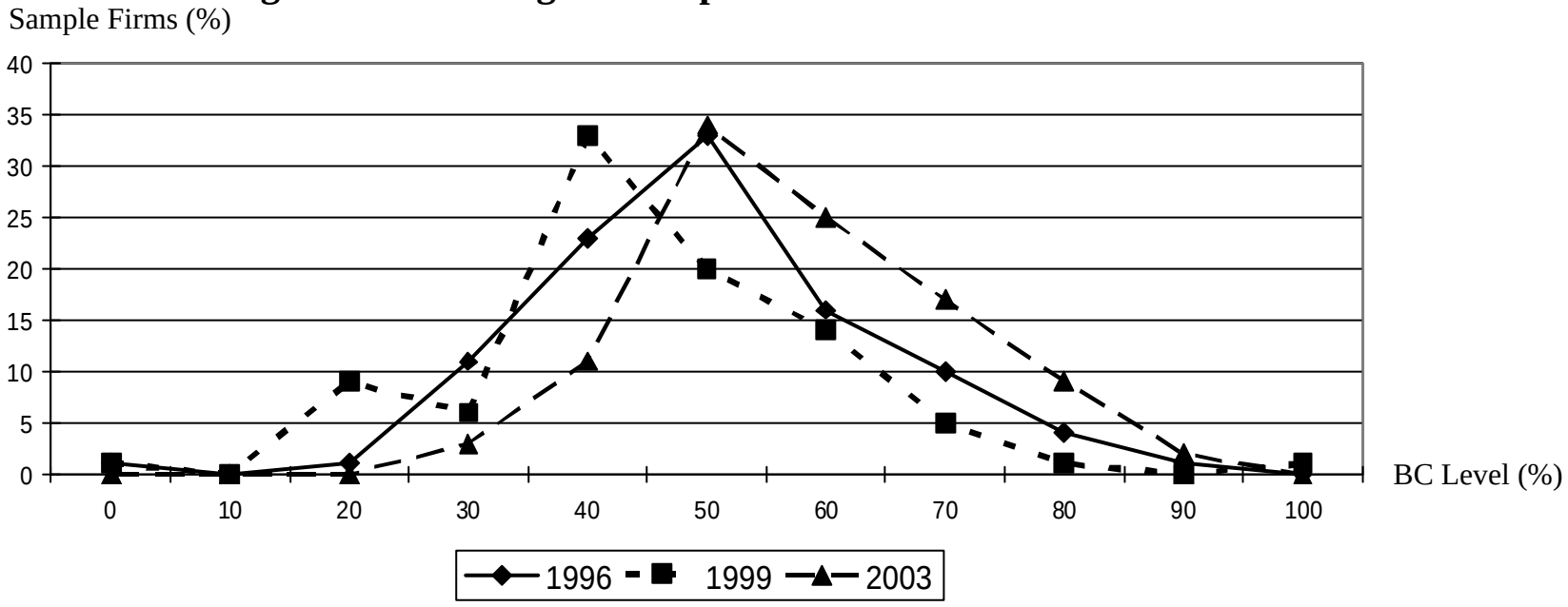

Figure 4: Simulation to the Cubic Relation between IO and DO

$$y = \begin{cases} 0.78 - 4.04x + 9.84x^2 - 9.60x^3 if\ (x, y) \in Firms1996 \\ 0.84 - 2.14x + 6.12x^2 - 6.48x^3 if\ (x, y) \in Firms1999 \\ 0.90 - 2.03x + 9.50x^2 - 17.88x^3 if\ (x, y) \in Firms2003 \end{cases}$$

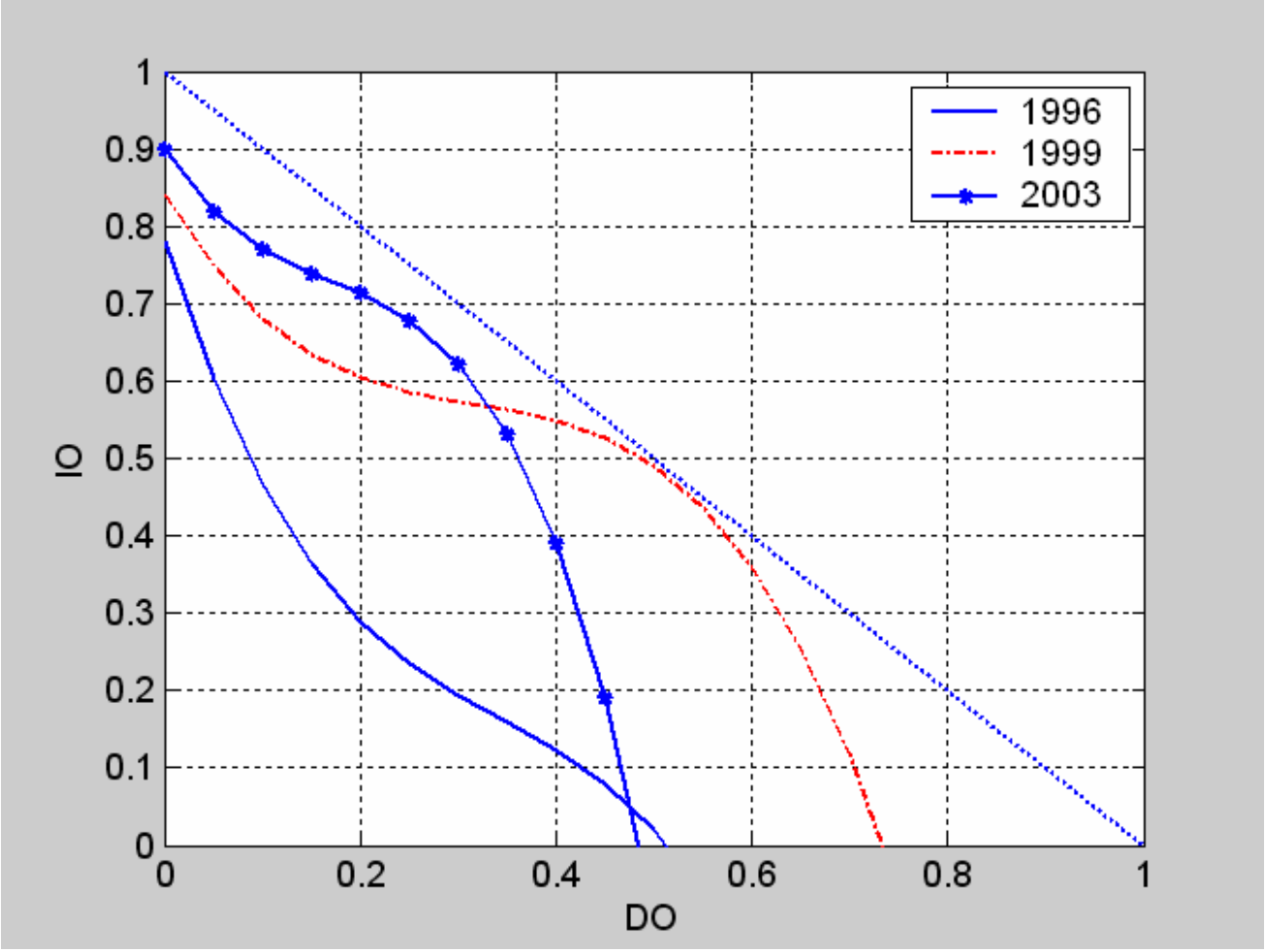

Table 1: Descriptive Statistics of the variables used in this study

IO is the aggregate shareholdings held by individual institutional investors with at least 3% ownership; DO is the aggregate shareholdings held by directors; BC is the board composition, measured by the proportion of NEDs sitting on the board; BS is board size; MV is the year end market capitalisation; BM is book-to-market ratio; ROA is income before Interests, Taxes and Depreciation / Amortization (EBITDA) divided by total assets; LEV is leverage derived from total debt divided by total assets; DY is dividend per share divided by year end share price; AGE is the number of years that the company has been listed in the London Stock Exchange; VOL is the variance of share return in the year; LIQ is the average share turnover for previous 12 months, which is derived from trading volume divided by total outstanding shares issues; Beta is company Beta derived from the market adjusted model; SG is the change in sales compared with the previous year; and NED is the number of NEDs sitting on the board. SG and NED have only been reported for 2003.

	Size	Mean	St. Dev	Median	Min.	Max.
1996 Sample						
Institutional Ownership (IO)	674	0.26	0.17	0.25	0.00	0.78
Directors' Ownership (DO)	674	0.07	0.13	0.01	0.00	0.84
Board Composition (BC)	674	0.47	0.15	0.54	0.00	0.90
Board Size (BS)	674	8.52	2.84	8.10	4.00	20.00
Market Capitalization (£m') (MV)	674	1164.22	3301.84	215.18	4.92	39585.26
Book to Market Ratio (BM)	674	0.52	0.93	0.34	0.00	17.34
Return on Asset (ROA)	674	0.10	0.17	0.10	-1.42	2.00
Leverage (LEV)	674	0.40	0.78	0.23	0.00	9.78
Dividend Yield (DY)	674	0.04	0.06	0.03	0.00	1.50
Listing Age (AGE)	674	15.86	13.49	11.00	1.00	42.00
Share Return Volatility (VOL)	674	0.07	0.04	0.06	0.02	0.51
Share Turnover (LIQ)	674	0.08	0.28	0.05	0.00	6.33
Company Beta (Beta)	674	0.83	0.37	0.78	0.07	2.13
1999 Sample						
Institutional Ownership (IO)	577	0.26	0.15	0.26	0.00	0.84
Directors' ownership (DO)	577	0.08	0.14	0.01	0.00	0.75
Board Composition (BC)	577	0.49	0.14	0.50	0.00	1.00
Board Size (BS)	577	8.49	2.52	8.00	4.00	16.00
Market Capitalization (£m') (MV)	577	1833.22	6376.53	230.40	7.00	86904.94
Book to Market Ratio (BM)	577	0.56	0.59	0.42	0.00	70.41
Return on Asset (ROA)	577	0.14	0.13	0.14	-1.06	7.55
Leverage (LEV)	577	0.34	2.88	0.21	0.00	0.78
Dividend Yield (DY)	577	0.03	0.03	0.03	0.00	0.21
Listing Age (AGE)	577	16.27	16.62	10.00	1.00	68.0
Share Return Volatility (VOL)	577	0.13	0.06	0.12	0.03	0.80
Share Turnover (LIQ)	577	0.14	1.40	0.05	0.00	31.20
Company Beta (Beta)	577	0.98	0.40	0.94	0.07	2.13

2003 Sample						
Institutional Ownership (IO)	564	0.28	0.17	0.26	0.00	0.90
Directors' ownership (DO)	564	0.06	0.12	0.01	0.00	0.84
Board Composition (BC)	564	0.54	0.13	0.54	0.00	0.90
Board Size (BS)	564	8.60	2.52	8.10	4.00	20.00
Market Capitalization (£m') (MV)	564	2261.20	8841.88	318.40	27.71	100131.06
Book to Market Ratio (BM)	564	0.62	1.17	0.46	0.00	24.70
Return on Asset (ROA)	564	0.11	0.47	0.09	-2.00	7.34
Leverage (LEV)	564	0.38	0.76	0.24	0.00	10.46
Dividend Yield (DY)	564	0.03	0.02	0.03	0.00	0.16
Listing Age (AGE)	564	17.67	15.13	11.00	1.00	72.00
Share Return Volatility (VOL)	564	0.12	0.07	0.10	0.04	0.52
Share Turnover (LIQ)	564	0.10	0.10	0.08	0.00	1.22
Company Beta (Beta)	564	1.06	0.39	1.02	0.12	2.48
Sales Growth (SG)	564	1.78	40.07	0.05	-1.00	936.47
No. of NEDs (NED)	564	4.70	1.80	4.00	0.00	12.00

Table 2: Pearson Correlation Matrices

IO is the aggregate shareholdings held by individual institutional investors with at least 3% ownership; DO is the aggregate shareholdings held by directors; BC is the board composition derived from the proportion of NEDs sitting on the board; FS is firm size, measured by log(MV), where MV is the year end market capitalisation; BM is book-to-market ratio; ROA is income before Interests, Taxes and Depreciation / Amortization (EBITDA) divided by total assets; DY is dividend per share divided by year end share price; LEV is leverage derived from total debt divided by total assets; AGE is the number of years that the company has been listed; VOL is share return volatility derived from the standard deviations of monthly share returns in previous 24 months; LIQ is the average share turnover for previous 12 months, which is derived from trading volume divided by total outstanding shares issued; Beta is company Beta derived from the market adjusted model; SG is the change in sales compared with the previous year; and NED is the natural logarithm number of NEDs sitting on board.

	IO	DO	BC	FS	BM	ROA	DY	LEV	AGE	VOL	LIQ	Beta	BS	SG
1996														
DO	**-0.29**													
BC	**0.20**	**-0.23**												
FS	**-0.26**	**-0.29**	**0.18**											
BM	0.04	-0.05	0.05	-0.05										
ROA	0.04	0.09	-0.06	-0.08	0.00									
DY	-0.01	**-0.14**	-0.04	-0.10	**0.22**	-0.02								
LEV	-0.03	-0.02	-0.01	0.06	0.09	0.06	-0.00							
AGE	-0.00	**-0.11**	**-0.12**	0.02	0.08	0.01	**0.11**	-0.08						
VOL	0.08	**0.14**	0.07	**-0.27**	0.07	0.01	-0.08	-0.04	**-0.22**					
LIQ	-0.04	-0.01	-0.03	0.04	-0.01	0.01	-0.08	-0.00	-0.08	0.04				
Beta	0.08	-0.02	0.00	0.02	-0.01	-0.03	-0.05	0.04	-0.04	0.07	**0.12**			
BS	**-0.16**	**-0.15**	0.02	**0.59**	-0.02	-0.08	-0.02	0.05	-0.04	**-0.12**	-0.01	**0.22**		
1999														
DO	**-0.15**													
BC	0.10	**-0.17**												
FS	**-0.27**	**-0.30**	**0.20**											
BM	-0.01	0.07	-0.06	-0.00										
ROA	-0.01	0.06	-0.06	0.00	0.00									
DY	-0.00	**-0.23**	-0.00	**0.13**	0.06	0.00								
LEV	-0.03	-0.03	**0.11**	0.09	-0.00	0.06	-0.01							
AGE	**-0.12**	**-0.27**	-0.00	**0.23**	-0.06	0.06	**0.34**	0.06						
VOL	0.06	**0.19**	-0.02	**-0.24**	0.02	0.02	**-0.28**	-0.04	**-0.27**					
LIQ	-0.04	**0.13**	0.03	0.03	0.01	0.01	0.03	-0.00	-0.05	-0.02				
Beta	**0.14**	-0.02	0.00	0.02	-0.01	-0.03	-0.07	0.04	-0.06	0.04	**0.35**			
BS	**-0.15**	**-0.22**	-0.02	**0.58**	-0.02	0.02	**0.11**	0.07	**0.15**	**-0.15**	-0.02	0.02		

2003														
DO	**-0.17**													
BC	**0.14**	**-0.20**												
FS	**-0.32**	**-0.23**	**0.24**											
BM	-0.06	0.05	-0.08	-0.06										
ROA	-0.07	0.07	-0.11	0.07	-0.07									
DY	**-0.20**	**-0.16**	-0.10	**0.17**	0.04	**0.24**								
LEV	-0.02	**-0.11**	**0.11**	**0.19**	0.11	0.10	0.11							
AGE	**-0.11**	-0.06	**-0.11**	-0.04	0.06	0.02	**0.18**	-0.07						
VOL	**0.17**	0.06	**0.13**	**-0.27**	-0.05	**-0.43**	**-0.43**	**-0.15**	-0.09					
LIQ	**-0.16**	**-0.17**	0.07	**0.33**	-0.03	-0.02	-0.01	0.05	-0.08	**0.15**				
Beta	**0.15**	-0.00	0.00	0.02	-0.01	-0.03	-0.05	0.04	-0.03	**0.61**	**0.14**			
BS	**-0.20**	**-0.20**	0.06	**0.62**	0.01	-0.02	**0.12**	**0.12**	0.01	**-0.13**	**0.15**	0.07		
SG	0.05	**0.16**	-0.03	-0.02	0.01	0.03	-0.04	-0.05	-0.09	-0.04	-0.02	-0.08	0.04	
NED	-0.06	-0.07	**0.67**	**0.60**	-0.05	-0.09	0.03	**0.16**	-0.06	-0.02	**0.16**	**0.12**	**0.76**	0.01

Notes: Correlations that are statistically significant at the 1% level are shown in bold.

Table 3: Results for the Tobit Model (c^2 statistics in Parentheses)

$$IO = a_0 + a_1 DO + a_2 BC + a_3 FS + a_4 ROA + a_5 BM + a_6 DY + a_7 LEV + a_8 AGE + a_9 VOL + a_{10} LIQ + a_{11} BETA + e \quad (1)$$

IO is the aggregate shareholdings held by individual institutional investors with at least 3% ownership; DO is the aggregate shareholdings held by directors; BC is the board composition derived from the proportion of NEDs sitting on the board; FS is firm size, measured by log(MV), where MV is the year end market capitalisation; BM is book-to-market ratio; ROA is income before Interests, Taxes and Depreciation / Amortization (EBITDA) divided by total assets; DY is dividend per share divided by year end share price; LEV is leverage derived from total debt divided by total assets; AGE is the number of years that the company has been listed; VOL is share return volatility derived from the standard deviations of monthly share returns in previous 24 months; LIQ is the average share turnover for previous 12 months, which is derived from trading volume divided by total outstanding shares issued; and Beta is company Beta derived from the market adjusted model.

Independent Variables	1996				1999				2003			
	3% ≤ IO N=674	5% ≤ IO N=380	10% ≤ IO N=267	20% ≤ IO N=77	3% ≤ IO N=577	5% ≤ IO N=424	10% ≤ IO N=292	20% ≤ IO N=69	3% ≤ IO N=564	5% ≤ IO N=410	10% ≤ IO N=275	20% ≤ IO N=79
Intercept	-0.65*** (11.81)	-1.00*** (22.23)	-1.87*** (64.80)	-1.51*** (24.11)	-0.90*** (30.04)	-1.10*** (32.59)	-1.83*** (73.17)	-1.44*** (18.42)	-0.53*** (8.42)	-0.57** (6.39)	-0.76*** (8.58)	-0.49 (1.50)
DO	**-1.97***** (85.92)	**-1.73***** (40.71)	**-1.34***** (16.52)	**-3.70***** (7.86)	**-0.65***** (11.73)	**-0.62***** (15.58)	-0.27 (1.05)	-0.39 (0.86)	**-1.13***** (25.00)	**-0.96***** (11.14)	**-1.18***** (15.28)	**-1.21***** (7.15)
BC	**0.86***** (27.92)	**0.74***** (25.35)	**0.99***** (23.19)	**0.51**** (4.46)	**0.57***** (10.85)	**0.59***** (8.55)	**0.84***** (15.12)	**0.79**** (5.69)	**0.67***** (14.98)	**0.62***** (8.59)	**0.23*** (2.84)	0.61 (2.61)
FS	**-0.13***** (35.34)	**-0.08***** (9.92)	-0.03 (2.00)	-0.09 (2.06)	**-0.08***** (26.93)	**-0.07***** (11.53)	-0.01 (0.08)	-0.02 (0.29)	**-0.11***** (41.32)	**-0.09***** (17.35)	-0.02 (0.50)	-0.04 (1.19)
BM	0.01 (0.33)	0.02 (0.29)	0.04 (2.17)	0.03 (1.14)	**0.08**** (4.34)	0.07 (2.69)	0.04 (0.76)	0.04 (0.29)	-0.00 (0.00)	-0.01 (0.05)	-0.05 (1.36)	**-0.14*** (3.79)
ROA	-0.27 (2.19)	**-0.48**** (5.72)	**-0.64***** (7.22)	0.37 (0.73)	**-0.06**** (4.34)	**-0.05*** (2.73)	-0.03 (0.77)	0.02 (0.00)	**0.30*** (2.91)	0.35 (2.56)	0.31 (1.68)	0.29 (1.06)
DY	-0.92 (0.59)	-1.02 (1.19)	-1.64 (1.72)	**-3.81***** (7.39)	-0.39 (0.20)	0.02 (0.00)	0.38 (0.13)	**-3.04*** (3.11)	**-4.89***** (15.18)	**-6.82***** (18.97)	**-7.29***** (15.99)	**-4.82*** (3.21)
LEV	**0.33***** (7.63)	**0.27**** (4.42)	0.17 (1.66)	-0.06 (0.18)	0.05 (0.18)	0.09 (0.38)	0.07 (0.17)	**-0.58**** (4.87)	0.02 (0.04)	0.00 (0.00)	0.08 (0.26)	-0.21 (1.16)

AGE	**-0.04*** (2.84)	**-0.04*** (3.10)	-0.02 (0.58)	-0.05 (1.83)	**-0.04*** (2.77)	**-0.04*** (2.31)	**-0.06*** (3.38)	-0.06 (1.39)	**-0.09***** (13.78)	**-0.12***** (13.74)	**-0.11***** (10.06)	**-0.09*** (3.53)
VOL	-0.80 (0.89)	-0.81 (0.74)	**-2.42**** (5.24)	**-3.79**** (5.23)	-0.41 (0.73)	-0.45 (0.64)	-0.09 (0.02)	-0.33 (0.07)	-0.10 (0.03)	-0.03 (0.00)	-0.08 (0.01)	-0.01 (0.00)
LIQ	-0.06 (0.68)	-0.07 (0.85)	**-0.12*** (3.15)	**-3.67***** (18.33)	**-0.03*** (3.79)	-0.02 (2.44)	**-0.02*** (2.95)	0.63 (0.28)	**-1.00***** (25.63)	**-1.39***** (26.16)	**-2.48***** (31.25)	**-2.34***** (13.11)
Beta	0.05 (0.57)	0.11 (1.96)	**0.18**** (4.41)	**0.25**** (5.59)	**0.06*** (1.04)	0.05 (0.49)	**0.13*** (2.80)	0.14 (1.45)	**0.16**** (4.76)	**0.18**** (3.85)	0.17 (2.67)	0.18 (1.76)
***Pseudo* R-squared (%)**	**28.92**	**23.23**	**18.05**	**11.65**	**25.39**	**24.04**	**15.31**	**12.19**	**23.42**	**19.33**	**13.34**	**11.41**

*, **, and ***, indicate significant at 10%, 5%, and 1% level for the c^2 statistics test.

Table 4: Results for the Nonlinear Models (c^2 statistics in parentheses)

$$IO = a_0 + a_1 DO + a_2 DO^2 + a_3 BC + a_4 FS + a_5 ROA + a_6 BM + a_7 DY + a_8 LEV + a_9 AGE + a_{10} VOL + a_{11} LIQ + a_{12} BETA + e \quad (2)$$

$$IO = a_0 + a_1 DO + a_2 DO^2 + a_3 DO^3 + a_4 BC + a_5 FS + a_6 ROA + a_7 BM + a_8 DY + a_9 LEV + a_{10} AGE + a_{11} VOL + a_{12} LIQ + a_{13} BETA + e \quad (3)$$

where IO is the aggregate shareholdings held by individual institutional investors with at least 3% ownership; DO is the aggregate shareholdings held by directors; DO^2 and DO^3 are the square and cubic terms of directors' ownership; BC is the board composition derived from the proportion of NEDs sitting on the board; FS is firm size, measured by log(MV), where MV is the year end market capitalisation; BM is book-to-market ratio; ROA is income before Interests, Taxes and Depreciation / Amortization (EBITDA) divided by total assets; DY is dividend per share divided by year end share price; LEV is leverage derived from total debt divided by total assets; AGE is the number of years that the company has been listed; VOL is share return volatility derived from the standard deviations of monthly share returns in previous 24 months; LIQ is the average share turnover for previous 12 months, which is derived from trading volume divided by total outstanding shares issued; and Beta is company Beta derived from the market adjusted model.

Independent Variables	**1996 (N=674)**		**1999(N=577)**		**2003(N=564)**	
	(2)	**(3)**	**(2**	**(3)**	**(2)**	**(3)**
Intercept	-0.60***	-0.54**	-0.87***	-0.87***	-0.60***	-0.51**
	(8.88)	(6.57)	(24.88)	(20.17)	(10.26)	(7.43)
DO	**-2.40*****	**-4.04*****	**-1.06****	**-2.14****	**-2.77***	**-2.03****
	(15.70)	(24.88)	(3.92)	(5.82)	(2.94)	(4.74)
DO^2	0.91	**9.84*****	0.09	**6.12***	0.13	**9.50****
	(0.57)	(7.53)	(0.66)	(3.83)	(0.04)	(4.01)
DO^3		**-9.60****		**-6.48***		**-17.88*****
		(5.55)		(3.14)		(8.14)
BC	**0.83*****	**0.82*****	**0.54*****	**0.53*****	**0.70*****	**0.67*****
	(24.43)	(23.59)	(9.77)	(8.82)	(15.92)	(14.93)
FS	**-0.13*****	**-0.14*****	**-0.09*****	**-0.09*****	**-0.11*****	**-0.11*****
	(35.50)	(36.55)	(27.61)	(27.67)	(38.00)	(40.69)
BM	0.01	0.02	**0.08****	**0.08****	-0.00	-0.01
	(0.32)	(0.40)	(4.38)	(4.19)	(0.01)	(0.08)
ROA	-0.25	-0.23	**-0.06****	**-0.06****	**0.31***	**0.30***

	(1.88)	(1.58)	(4.38)	(4.19)	(3.15)	(3.00)
DY	-1.56	-1.41	-0.47	-0.51	**-4.78*****	**-5.21*****
	(1.89)	(1.68)	(0.28)	(0.32)	(14.58)	(17.38)
LEV	**0.33*****	**0.32*****	0.05	0.05	0.04	0.03
	(7.59)	(7.07)	(0.14)	(0.15)	(0.09)	(0.09)
AGE	**-0.04***	**-0.04***	**-0.04***	**-0.05***	**-0.09*****	**-0.09*****
	(3.10)	(3.13)	(3.12)	(3.41)	(12.53)	(12.92)
LIQ	-0.06	-0.05	**-0.03****	**-0.03****	**-1.02*****	**-1.03*****
	(0.67)	(0.65)	(4.08)	(4.29)	(26.10)	(28.13)
VOL	-0.80	-0.69	-0.39	-0.41	-0.13	-0.07
	(0.89)	(0.65)	(0.67)	(0.73)	(0.06)	(0.02)
Beta	0.05	0.05	0.07	0.07	**0.16****	**0.15****
	(0.49)	(0.47)	(1.15)	(1.26)	(4.66)	(4.33)
***Pseudo* R-squared (%)**	29.66	30.15	25.34	25.44	23.43	23.55

*, **, and ***, indicate significant at 10%, 5%, and 1% level for the c^2 statistics test.

Table 5: Results for the Simultaneous Equations by using 3SLS for 2003 Sample (two-tailed t statistics in parentheses)

$$IO = a_0 + a_1 DO + a_2 BC + a_3 FS + a_4 BM + a_5 ROA + a_6 DY + a_7 LEV + a_8 AGE + a_9 VOL + a_{10} LIQ + a_{11} Beta$$
$$DO = b_0 + b_1 IO + b_2 BC + b_3 FS + b_4 BM + b_5 ROA + b_6 DY + b_7 LEV + b_8 AGE + b_9 VOL + b_{10} SG \quad (4)$$
$$BC = g_0 + g_1 IO + g_2 DO + g_3 FS + g_4 BM + g_5 ROA + g_6 DY + g_7 LEV + g_8 AGE + g_9 VOL + g_{10} NED$$

IO is the aggregate shareholdings held by individual institutional investors with at least 3% ownership; DO is the aggregate shareholdings held by directors; BC is the board composition derived from the proportion of NEDs sitting on the board; FS is firm size, measured by log(MV), where MV is the year end market capitalisation; BM is book-to-market ratio; ROA is income before Interests, Taxes and Depreciation / Amortization (EBITDA) divided by total assets; DY is dividend per share divided by year end share price; LEV is leverage derived from total debt divided by total assets; AGE is the number of years that the company has been listed; VOL is share return volatility derived from the standard deviations of monthly share returns in previous 24 months; LIQ is the average share turnover for previous 12 months, which is derived from trading volume divided by total outstanding shares issued; Beta is company Beta derived from the market adjusted model.; SG is the change in sales during the year; and NED is the natural logarithm of number of NEDs sitting on board.

Independent Variables	**Dependent Variables (2003, N=564)**		
	IO	**DO**	**BC**
Intercept	0.34*	0.35***	0.39**
	(1.67)	(3.08)	(2.24)
IO		-0.26	0.76
		(-0.73)	(1.51)
DO	**-0.24****		-0.09
	(-2.44)		(-0.18)
BC	**0.41***	**-0.29*****	
	(1.78)	(-3.40)	
FS	**-0.04*****	**-0.01****	**-0.02*****
	(-5.88)	(-2.20)	(-3.09)
BM	-0.01	-0.00	-0.01
	(-0.54)	(-0.11)	(-0.88)

ROA	0.00 (0.05)	**0.09**** (2.27)	0.01 (0.10)
DY	**-1.13***** (-2.67)	**-0.88***** (-2.91)	-0.39 (-0.91)
LEV	0.03 (0.80)	-0.01 (-0.35)	0.00 (0.03)
AGE	**-0.02**** (-2.08)	-0.01 (-1.55)	-0.01 (-0.66)
VOL	-0.02 (-0.12)	0.08 (0.07)	0.22 (1.34)
LIQ	**-0.23***** (-2.79)		
Beta	**0.03*** (1.84)		
SG		**0.04**** (2.20)	
NED			**0.29***** (5.19)
***Adjusted* R-squared (%)**	**13.84**	**10.20**	**23.01**
System Weighted R-squared (%)		**30.93**	

*, **, and ***, indicate significant at 10%, 5%, and 1% level for the two-tailed *t* statistics test.