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Institutional block-holdings of UK firms: do corporate governance mechanisms matter?

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Using a sample of UK firms, we find that institutional block-holding is negatively associated with directors' ownership and is positively associated with board composition, suggesting that institutional block-holders regard directors' ownership and board composition as substitute and complementary control mechanisms, respectively. We also show that UK institutional block-holders prefer smaller firms and firms with a shorter listing history. The presence of institutional block-holders is associated with smaller boards and lower trading liquidity. Finally, our results indicate that the investment preference of UK institutional block-holders varies with the level of their shareholding.

Keywords: institutional block-holding; directors' ownership; board structure; corporate governance

JEL Classification: G3; H39

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 (e.g. Badrinath, Gerald, and Jayant 1989; Lakonishok, Shleifer, and Vishny 1994; Del Guercio 1996; Falkenstein 1996) document that US institutional investors prefer to invest in firms with superior past financial performance, lower volatility of share price, higher trading liquidity, larger size, and longer listing history. Several studies investigate the investment behaviour of institutional investors outside of the USA and find somewhat different results. For instance, Nielsen (2004) finds that pension fund companies do not prefer liquid stocks in Denmark. Hussain (2000) finds that UK institutional block-holders prefer smaller firms and firms with lower ownership concentration. More importantly, Ferreira and Matos (2008) find that institutional investors prefer large and liquid stocks with a good corporate governance practice, especially in countries where country-level investor protection and quality of institutions are weak. Their study also indicates that the investment behaviour of institutional shareholders varies across countries and over time.

Most of the previous studies investigate the association between institutional ownership and firm characteristics and have largely ignored how investee firms' corporate governance control mechanisms and the investment behaviour of institutional investors could affect each other. This study contributes to the literature by directly examining the investment preferences of institutional block-holders. The focus of this study is on the relationship between institutional block-holding

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and two major internal corporate governance control mechanisms, i.e. board composition and directors' shareholding. We believe that this is an important research question for the following reasons. First, if institutional investors prefer firms with sound governance practices, then this investment preference can easily trigger an investment shift and dramatically affect firms' equity price (Gompers and Metrick 2001). Secondly, institutional investors usually hold more significant stakes than individuals and hence can easily influence companies' operating, investment, and governance policies. Finally, institutional investors have been encouraged to participate in the decision-making process and to improve the corporate governance setup of their investee firms in order to improve the future financial performance of their investee firms.

Using a large UK sample, we find that institutional block-holding is negatively associated with directors' ownership, and more importantly, the relation appears to be non-linear. We also find a positive association between institutional block-holding and board composition, which is robust after controlling for potential endogeneity. These findings suggest that institutional block-holders regard directors' ownership as a substitute control mechanism, but perceive board composition as a complementary control mechanism. In addition, we find that UK institutional block-holders prefer firms with smaller size and shorter listing history. Further, their presence is negatively associated with board size (BS) and trading liquidity. Finally, our results indicate that the investment preferences of UK institutional block-holders vary according to the level of their shareholdings.

The contribution of this paper to the existing literature is that it enhances our understanding of the interaction between shareholdings by insiders (i.e. directors) and outsiders (institutional block-holders). We find a complementary (substitute) relationship between institutional block-holding and board composition (directors' ownership) after controlling for endogeneity and other relevant biases.

The rest of the paper is organised 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. Finally, we draw conclusions in Section 6.

2. Literature review and hypotheses development

A McKinsey survey as reported by Coombes and Watson (2000) shows that three-quarters of the institutional investors state that board quality of a firm is at least as important as its financial performance. Useem, Bowman, and Irvine (1993) find that the composition and function of the board are critical to US institutional investors, who appear to prefer an independent board with board members who have diversified skills and experiences. In the UK, in 2003, *Just Pensions* (Gribben and Olsen 2003) published the results of a survey of its trustees, indicating that good corporate governance was regarded as the most significant factor for firm valuation. Recent surveys by Russell Reynolds Associates (RRA 2003–2005) show that the importance of corporate governance as a decision factor for institutional investors has increased over time. RRA surveys find that for about 80% of the UK institutional investors, the quality of a company's board of directors is particularly important.

Apart from the above survey evidence, institutional investors also have the following incentives to prefer firms with 'better' corporate governance mechanisms. First, these mechanisms may effectively reduce monitoring or agency cost. Monitoring costs are high in portfolio firms where institutional investors hold block-holdings. Bushee and Noe (2000) find that institutional block-holders prefer investee firms with higher quality disclosure as a way to offset monitoring

costs. The presence of stringent fiduciary responsibilities can lead some institutional investors to prefer firms with 'better' governance mechanisms, which may reduce the possibility of negative outcomes due to managerial fraud or negligence (Del Guercio 1996). Secondly, institutional investors' preference for firm characteristics may be related to their preference for corporate governance mechanisms. For example, superior firm performance could be associated with 'better' corporate governance mechanisms, which is not captured by other firm characteristics. Some studies (e.g. Gompers, Ishii, and Metrick 2003; Larcker, Richardson, and Tuna 2007) find that better-governed firms exhibit higher firm values, better operating performance, and potentially less failures in corporate investment. Finally, political motivations could create incentives for some institutional investors to focus on governance mechanisms (Smith 1996). These three incentives when combined could lead institutional investors, as a homogeneous group, to exhibit preferences for 'better' corporate governance mechanisms in their investee firms. This study focuses on the relationship between institutional block-holdings and the most important two internal governance mechanisms, i.e. directors' ownership and board composition.

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. Therefore, in the context of institutional block-holdings, we would expect institutional block-holders to be attracted to firms with high insider ownership. Indeed, some surveys (e.g. Ramsay, Stapledon, and Fong 2000; Coombes and Watson 2000) show that institutional investors would prefer to invest in firms with higher insider ownership. As a result, the interest alignment effect predicts a positive relationship between institutional block-holding and directors' ownership. However, some of the empirical evidence based in the USA points to the contrary that institutional investors may not be interested in firms with high managerial shareholding because managers may have been entrenched. For example, Bathala, Moon, and Rao (1994) find that directors' ownership is negatively associated with institutional ownership in the USA, suggesting a potential substitute effect between these two ownerships. Hussain (2000) also finds a similar result using a UK sample. Hence, whether the relationship between institutional and managerial ownership is dominated by the substitute or alignment effect is an empirical issue. We therefore have the following two competing hypotheses.

Hypothesis 1a: There is a negative relationship between the level of institutional block-holdings and directors' ownership (i.e. the substitute effect).

Hypothesis 1b: There is a positive relationship between the level of institutional block-holdings and directors' ownership (i.e. the interest alignment effect).

Furthermore, the above relationship could be non-linear. In other words, the relationship could be positive (negative) when the level of directors' ownership is low (high) because the interest alignment effect (the substitute effect) dominates.¹ This leads us to predict:

Hypothesis 2: The relationship between institutional block-holdings and directors' ownership is positive (negative) when the level of directors' ownership is low (high).

In addition to managerial ownership, non-executive directors are also central to the effective resolution of agency problem between managers and shareholders (Fama and Jensen 1983). Consistent with this view, Rosenstein and Wyatt (1990) find that, indeed, appointments of outside directors increase shareholders' wealth in the USA. Institutional block-holders are more likely to invest in those companies that are effectively monitored by non-executive directors. In the UK, many studies (e.g. Young 2000; Peasnell, Pope, and Young 2003; Lasfer 2006) find a positive

relationship between institutional ownership and board composition. As a result, we predict that non-executive directors and institutional block-holdings are likely to be complementary corporate governance control mechanisms after controlling for other factors, and hence the following.

Hypothesis 3: There is a positive relationship between institutional block-holdings and the proportion of non-executive directors sitting on the board.

To consider the effects of other factors on the investment preferences of UK institutional block-holders, we also control for the following variables based on the literature. Badrinath, Gerald, and Jayant (1989) find that the level of institutional ownership is positively associated with firm size (FS), past performance, company beta, trading liquidity, and listing history and negatively associated with return volatility. There are, however, some inconsistent findings in the literature. For example, Falkenstein (1996) finds that mutual funds prefer stocks with high volatility; Cready (1994) finds that institutional investors invest more in firms with relatively low dividends; and Gompers and Metrick (2001) find that the shareholding level of large institutional investors is negatively related to investee firms' past performance because institutional investors are capable of identifying companies with prospects but are poorly run. Furthermore, Bushee (2001) finds that US institutional investors prefer investing in firms with low leverage because low leverage indicates low bankruptcy risk. Lakonishok, Shleifer, and Vishny (1994) find that institutional investors prefer 'glamour stocks' that normally have low book-to-market (BM) ratios. Bennett, Sias, and Starks (2003) also document that the investment preferences of US institutional investors to large firms had been decreasing in the period 1990–1997 in comparison with the period 1983–1990 due to a significant increase in acquisition cost. Finally, Hussain (2000) finds that UK institutional block-holders prefer smaller firms and firms with lower directors' ownership. He also finds that firms in the utility sector have significantly higher institutional ownership than firms in other industrial sectors. In summary, the investment preferences of institutional shareholders appear to be somewhat inconsistent in the literature.²

We follow the above studies to predict that institutional block-holding is negatively associated with leverage, dividend yield (DY), BM ratio, and company beta, but is positively associated with listing history and trading liquidity. We, however, do not predict the associations between institutional block-holding and return volatility, FS, and investee firms' past financial performance because of the mixed evidence in previous studies.

3. Methodology

In the UK, only those investors who own at least 3% of the total shares outstanding are disclosed in their investee firms' financial statements.³ To overcome data availability issue and to be consistent with previous studies (Falkenstein 1996; Gompers and Metrick 1998), we use a Tobit model to deal with the censored UK institutional shareholding data.⁴ We also use other shareholding thresholds, such as 5%, 10%, and 20%,⁵ for robustness purposes because different levels of institutional block-holdings may have different investment interests in their investee firms and different degrees of incentives to monitor investee firms (Maug 1998). The Tobit model is shown as follows:

$$IBH_{it} = \alpha_0 + \alpha_1 DO_{it} + \alpha_2 BC_{it} + \sum_{j=1}^{j=n} \alpha_{j+2} X_{ijt} + \varepsilon, \quad (1)$$

where IBH_{it} denotes the aggregated institutional block-holding 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 non-executive directors on the board; X_{ijt} is a vector of control variables j for firm i for period t , including FS, BM ratio, past return on asset (ROA), DY, leverage (LEV), listing history (AGE), share return volatility (VOL), share turnover (LIQ), and company beta (Beta). While we do not have a prediction on α_1 , we predict that α_2 will be positive and significant if Hypothesis 3 holds.

To test the potential non-linear relationship between institutional block-holdings and managerial shareholding, we add DO_{it}^2 and DO_{it}^3 to model (1). We expect the signs of their coefficients to be different if the non-linearity relationship holds. Hence,

$$IBH_{it} = \alpha'_0 + \alpha'_1 DO_{it} + \alpha'_2 DO_{it}^2 + \alpha'_3 BC_{it} + \sum_{n=j+3}^n \alpha'_{j+3} X_{ijt} + \varepsilon', \quad (2a)$$

$$IBH_{it} = \alpha''_0 + \alpha''_1 DO_{it} + \alpha''_2 DO_{it}^2 + \alpha''_3 DO_{it}^3 + \alpha''_4 BC + \sum_{n=j+4}^{n=n} \alpha''_{j+4} X_{ijt} + \varepsilon''. \quad (2b)$$

An important issue related to this study is the potential endogenous relationship between institutional ownership, directors' ownership, and board composition. Previous studies have used both two-stage and three-stage simultaneous regressions⁶ to overcome this problem. However, many studies find that empirical results are sensitive to the instrument variables used in simultaneous regressions and therefore need to be interpreted with caution. Furthermore, previous studies also suggest that the observed association between institutional shareholding, directors' ownership, and board composition could be spurious because of potential omitted variables. To overcome the above problem, Hermalin and Weisbach (2003) suggest using the change-to-change model. This study reports results from both simultaneous equations and the change-to-change model. The following simultaneous equations are used for empirical tests:

$$IBH = f(DO, BC, DY, ROA, FS, AGE, BM, LEV, VOL, LIQ, BETA), \quad (3a)$$

$$DO = f(IBH, BC, DY, ROA, FS, AGE, BM, LEV, VOL, SG, BS), \quad (3b)$$

$$BC = f(IBH, DO, DY, ROA, FS, AGE, BM, LEV, VOL, SG, SPLIT, CEOTENURE), \quad (3c)$$

where SG is the sales growth; SPLIT is a dummy variable, which is 1 if CEO is different from the chairman of the board and 0 otherwise; CEOTENURE is the tenure of the CEO. All the other variables are as defined previously.

Model (3a) uses beta and liquidity as instrument variables; model (3b) uses age, sales growth, and number of directors as instrument variables; model (3c) uses listing history, split of CEO and Chairman, and CEO tenure as instrument variables.

4. Data and descriptive statistics

This study covers the FTSE All Shares Index (FTSEASI) firms during the years 1996, 1999, and 2003. The FTSEASI includes 822, 803, and 699 firms in the 3 years, respectively. After excluding investment trusts (closed end funds) from the sample, we are left with 674, 577, and 569 firms for 1996, 1999, and 2003, respectively. Institutional block-holdings and directors' ownership data were hand collected from the Company REFS CDs. Board composition data were hand collected from the Company REFS CDs and BoardEx. Board composition is measured by the proportion of non-executive directors sitting on the board. Firms' listing history was collected from the London Share Price Database. Other data including DY, share price, BM ratio, total asset, and market

capitalisation were all collected from DataStream. Share return volatility and share turnover are calculated using share price, trading volume, and total outstanding shares, which were also collected from DataStream.

Figure 1 shows that a number of companies have institutional block-holdings around 30%, but most of our sample firms have institutional block-holdings between 10% and 50%. Very few firms have institutional block-holdings above 80%. Institutional block-holdings have been slightly increasing over the test period (around 23%, 27%, and 31% of our total sample firms in 1996, 1999, and 2003, respectively).

Figure 2 shows that directors' ownership does not change much for the 3 years with most of the firms having directors' ownership below 10%. About 80% of our sample firms have directors' ownership of approximately 10%; <10% of our sample firms have directors' ownership of approximately 20%. Very few firms have directors' ownership above 40%. This finding suggests that UK firms generally have very low directors' ownership.

Figure 3 shows that for most of the firms examined, the level of non-executive directors' participation (board composition) is anywhere from 30% to 80%. Less than one-third of the firms have a board composition of around 50% in 1999 and 2003, indicating that UK firms had increased

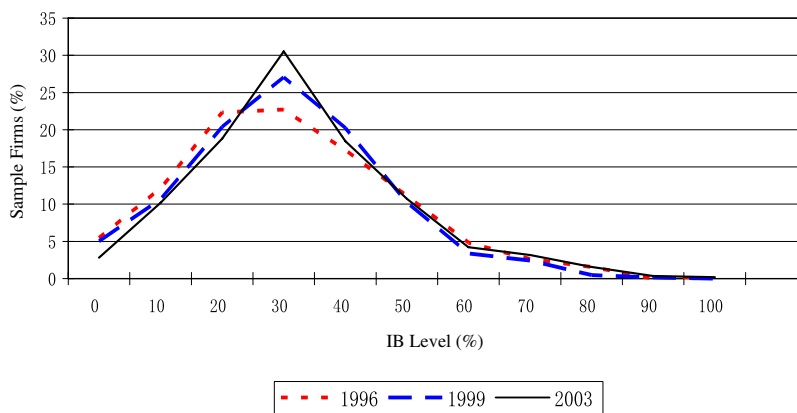


Figure 1. Percentage of sample firms with various levels of institutional block-holders.

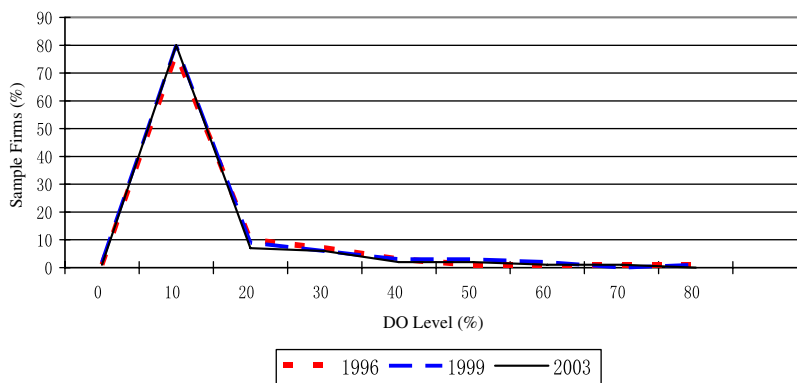


Figure 2. Percentage of sample firms with various levels of directors' shareholdings.

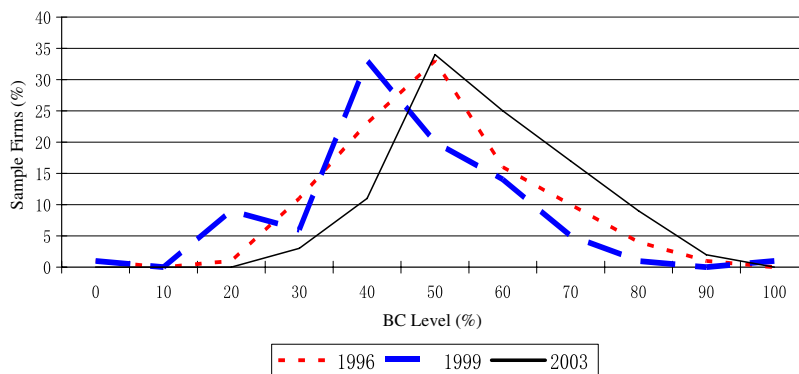


Figure 3. Percentage of sample firms with various levels of board composition.

board composition to 50% or above before the Higgs Report (2003). However, we still observe many UK firms with board composition below 50% during the test period.

Table 1 summarises the descriptive statistics for all variables examined in this study. Extreme observations are winsorised at the bottom and top percentiles (2%) to reduce the impact of potential outliers. The results show that the average institutional block-holding has increased slightly from 26% in 1996 and 1999 to 28% in 2003. The difference is significant at the 5% level (not shown in the table). The average directors' ownership increases from 7% in 1996 to 8% in 1999 and then decreases to 6% in 2003. This decrease in average directors' ownership between 1999 and 2003 is significant at the 1% level (not shown in the table). Interestingly, the proportion of non-executive directors has increased from 47% in 1996 to 49% and 54% in 1999 and 2003, respectively. The average BS slightly decreases from 8.52 in 1996 to 8.49 in 1999, but increases to 8.6 in 2003. These differences are, however, insignificant.

Stock market capitalisation 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. The average BM ratio is 56% for both 1996 and 1999 and increases to 62% in 2003. Mean ROA ranges from 10% to 14%; median ROA ranges from 9% to 14%. The year 1999 has the highest mean and median ROA of 14%. Mean leverage ranges from 34% to 40%. The average DY is 4.15% in 1996 and 2.69% in both 1999 and 2003. The differences between 1996 and 1999 and between 1996 and 2003 are significant at the 1% level, although the median DY remains at 3% in all 3 years. The above decrease in the average DY could be the result of the implementation of FA97⁷ and the popularity of share repurchase programmes starting from the mid-1990s.

The average listing ages are around 15–17 years for all the years considered in the study. 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 FTSEASI firms increased over the period of study. Sales growth for 2003 has a high average of 1.78 but a small median of 0.05, indicating that some of our sample firms have extremely high growth rates. The average number of non-executive directors sitting on boards is less than 5. Finally, average CEO tenure is about 5.43 years.

Correlation analysis results reported in Table 2 suggest that institutional block-holding is negatively correlated with directors' ownership in all 3 years, consistent with the prediction that institutional block-holding is a substitute control mechanism for directors' ownership. We also

Table 1. Descriptive statistics.

	Obs.	Mean	Median	Std. dev.	Min.	Max.
<i>Panel A: 1996 sample</i>						
Institutional block-holding (IBH)	674	0.26	0.25	0.17	0.00	0.78
Directors' ownership (DO)	674	0.07	0.01	0.13	0.00	0.84
Board composition (BC)	674	0.47	0.54	0.15	0.00	0.90
Dividend yield (DY)	674	0.04	0.03	0.06	0.00	1.50
Return on asset (ROA)	674	0.10	0.10	0.17	-1.42	2.00
Market capitalisation (£m')	674	1164.22	215.18	3301.84	4.92	39,585.26
Listing age (AGE)	674	15.86	11.00	13.49	1.00	42.00
Book-to-market ratio (BM)	674	0.52	0.34	0.93	0.00	17.34
Leverage (LEV)	674	0.40	0.23	0.78	0.00	9.78
Share turnover (LIQ)	674	0.08	0.05	0.28	0.00	6.33
Share return variance (VAR)	674	0.07	0.06	0.04	0.02	0.51
Board size (BS)	674	8.52	8.10	2.84	4.00	20.00
<i>Panel B: 1999 sample</i>						
Institutional block-holding (IBH)	577	0.26	0.26	0.15	0.00	0.84
Directors' ownership (DO)	577	0.08	0.01	0.14	0.00	0.75
Board composition (BC)	577	0.49	0.50	0.14	0.00	1.00
Dividend yield (DY)	577	0.03	0.03	0.03	0.00	0.21
Return on asset (ROA)	577	0.14	0.14	0.13	-1.06	7.55
Market capitalisation (£m')	577	1833.22	230.40	6376.53	7.00	86,904.94
Listing age (AGE)	577	16.27	10.00	16.62	1.00	45.0
Book-to-market ratio (BM)	577	0.56	0.42	0.95	0.00	17.41
Leverage (LEV)	577	0.34	0.21	2.88	0.00	0.78
Share turnover (LIQ)	577	0.14	0.05	1.40	0.00	31.20
Share return variance (VAR)	577	0.13	0.12	0.06	0.03	0.80
Board size (BS)	577	8.49	8.00	2.52	4.00	16.00
<i>Panel C: 2003 sample</i>						
Institutional block-holding (IBH)	564	0.28	0.26	0.17	0.00	0.90
Directors' ownership (DO)	564	0.06	0.01	0.12	0.00	0.84
Board composition (BC)	564	0.54	0.54	0.13	0.00	0.90
Dividend yield (DY)	564	0.03	0.03	0.02	0.00	0.16
Return on asset (ROA)	564	0.11	0.09	0.47	-2.00	0.73
Market capitalisation (£m')	564	2261.20	318.40	8841.88	27.71	100,131.06
Listing age (AGE)	564	17.67	11.00	15.13	1.00	48.00
Book-to-market ratio (BM)	564	0.62	0.46	1.17	0.00	24.70
Leverage (LEV)	564	0.38	0.24	0.76	0.00	10.46
Share turnover (LIQ)	564	0.10	0.08	0.10	0.00	1.22
Share return variance (VAR)	564	0.12	0.10	0.07	0.04	0.52
Board size (BS)	564	8.60	8.10	2.52	4.00	20.00

Note: IBH 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 non-executive directors sitting on the board; DY is the dividend per share divided by year end share price; ROA is the income before interests, taxes, and depreciation/amortisation (EBITDA) divided by total assets; BM is the book-to-market ratio; LEV is the leverage derived from total debt divided by total assets; FS is measured as the year end market capitalisation; AGE is the number of years that the company has been listed in the LSE; VAR 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; and BS is the board size measured as the total number of directors sitting on boards.

Table 2. Pearson correlation matrices.

	IBH	DO	BC	DY	ROA	FS	AGE	BM	LEV	LIQ	VAR
<i>1996 sample</i>											
DO	-0.29										
BC	0.20	-0.23									
DY	-0.01	-0.14	-0.04								
ROA	0.04	0.09	-0.06	-0.02							
FS	-0.26	-0.29	0.18	-0.10	-0.08						
AGE	-0.00	-0.11	-0.12	0.11	0.01	0.02					
BM	0.04	-0.05	0.05	0.22	0.00	-0.05	0.08				
LEV	-0.03	-0.02	-0.01	-0.00	0.06	0.06	-0.08	0.09			
LIQ	-0.04	-0.01	-0.03	-0.08	0.01	0.04	-0.08	-0.01	-0.00		
VAR	0.08	0.14	0.07	-0.08	0.01	-0.27	-0.22	0.07	-0.04	0.04	
BS	-0.16	-0.15	0.02	-0.02	-0.08	0.59	-0.04	-0.02	0.05	-0.01	-0.12
<i>1999 sample</i>											
DO	-0.15										
BC	0.10	-0.17									
DY	-0.00	-0.23	-0.00								
ROA	-0.01	0.06	-0.06	0.00							
FS	-0.27	-0.30	0.20	0.13	0.00						
AGE	-0.12	-0.27	-0.00	0.34	0.06	0.23					
BM	-0.01	0.07	-0.06	0.06	0.00	-0.00	-0.06				
LEV	-0.03	-0.03	0.11	-0.01	0.06	0.09	0.06	-0.00			
LIQ	-0.04	0.13	0.03	0.03	0.01	0.03	-0.05	0.01	-0.00		
VAR	0.06	0.19	-0.02	-0.28	0.02	-0.24	-0.27	0.02	-0.04	-0.02	
BS	-0.15	-0.22	-0.02	0.11	0.02	0.58	0.15	-0.02	0.07	-0.02	-0.15
<i>2003 sample</i>											
DO	-0.17										
BC	0.14	-0.20									
DY	-0.20	-0.16	-0.10								
ROA	-0.07	0.07	-0.11	0.24							
FS	-0.32	-0.23	0.24	0.17	0.07						
AGE	-0.11	-0.06	-0.11	0.18	0.02	-0.04					
BM	-0.06	0.05	-0.08	0.04	-0.07	-0.06	0.06				
LEV	-0.02	-0.11	0.11	0.11	0.10	0.19	-0.07	0.11			
LIQ	-0.16	-0.17	0.07	-0.01	-0.02	0.33	-0.08	-0.03	0.05		
VAR	0.17	0.06	0.13	-0.43	-0.43	-0.27	-0.09	-0.05	-0.15	0.15	
BS	-0.20	-0.20	0.06	0.12	-0.02	0.62	0.01	0.01	0.12	0.15	-0.13

Note: IBH 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 non-executive directors sitting on the board; DY (dividend yield) is dividend per share divided by year end share price; ROA is income before interests, taxes, and depreciation/amortisation (EBITDA) divided by total assets; FS is the firm size measured by $\log(MV)$, where MV is the year end market capitalisation; AGE is the number of years that the company has been listed; BM is the book-to-market ratio; LEV is the leverage derived from total debt divided by total assets; VAR is the share return volatility derived from the standard deviations of monthly share returns in previous 12 months; LIQ is the average share turnover for previous 12 months, which is derived from trading volume divided by total outstanding shares issued; and BS is the board size measured as the total number of directors sitting on boards. Correlations that are statistically significant at the 1% level are shown in bold.

find that UK institutional block-holding is negatively correlated with FS, consistent with Hussain (2000) in the UK and Bennett, Sias, and Starks (2003) in the USA.

Consistent with the prediction, we find a positive correlation between institutional block-holding and board composition. Although institutional block-holding is negatively correlated

with the DY in all 3 years, the correlation coefficient is significant only in 2003. Institutional block-holding appears to be negatively correlated with the number of years being listed on London Stock Exchange in all 3 years, indicating that institutional block-holders generally prefer firms with a shorter listing history. Surprisingly, institutional block-holding is never correlated with BM ratio, ROA, or leverage.

Directors' ownership is negatively correlated with board composition, FS, DY, listing age, and BS in all 3 years. Consistent with previous studies, we find that directors' ownership is higher when firms have weaker (Lasfer 2006) and smaller boards (Linck, Netter, and Yang 2008). Firms that are smaller and have a shorter listing history may have a more serious agency problem, which can be reduced through higher directors' ownership. DY is negatively correlated with directors' ownership in all 3 years. Board composition is positively correlated with FS in all 3 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 non-executive directors sitting on the board. The correlation coefficients (for all the 3 years considered in the study) between BS and FS are rather high at around 0.6. To avoid any potential multicollinearity, we only include FS in our regression model. Further analyses are discussed in the following regression section.

5. Regression results

Table 3 reports the results using the Tobit model.⁸ We partition institutional block-holdings into four groups. They are the groups with institutional block-holding > 3%, 5%, 10%, and 20%. Unlike ordinary least squares (OLS) coefficients in linear models, the coefficients in Tobit models cannot be interpreted as marginal effects. Therefore, we also report the marginal effect of a unit change in each independent variable on institutional block-holdings.⁹ The results show that institutional block-holding is consistently negatively associated with directors' ownership for all the block-holding thresholds for all the sample years except for higher thresholds (IBH \geq 10%) in 1999.

This finding excludes the possibility that institutional block-holders do not invest in companies with high directors' ownership because of potential management entrenchment (i.e. the opposing interest effect). To further examine this issue, we perform an additional test. We partition our firms into two subsamples¹⁰ by mean of directors' shareholding (i.e. 0.07), i.e. firms with directors' holdings greater and smaller than 0.07. We find a negative association between directors' shareholding and institutional block-holding in both subsamples. This indicates that there is a negative association between managerial shareholding and institutional block-holding even when the level of managerial shareholding is low.

The above findings generally support Hypothesis 1a that UK institutional block-holders regard directors' shareholding as a substitute control mechanism. In terms of economic significance, the marginal effects show that for a 1% increase in directors' ownership, the institutional block-holding decreases by 0.30–0.44% depending on the size of the block-holding.

Institutional block-holding is positively associated with board composition for all the threshold levels and for all the sample years except for the largest block-holdings category (IBH \geq 20%) in the year 2003. A potential reason for this finding is that institutional block-holders may demand more independent outside directors sitting on the board. Overall, we find evidence consistent with Hypothesis 3 that UK institutional block-holders regard independent non-executive directors as a complementary control mechanism. In terms of economic significance, the marginal effects show that for a 1% increase in board composition, the institutional block-holding increases by 0.15–0.23% depending on the size of the block-holding.¹¹

Table 3. Results for the Tobit model (χ^2 statistics in parentheses).

Independent variables	1996				1999				2003			
	3% \leq IBH <i>N</i> =674	5% \leq IBH <i>N</i> =380	10% \leq IBH <i>N</i> =267	20% \leq IBH <i>N</i> =77	3% \leq IBH <i>N</i> =577	5% \leq IBH <i>N</i> =424	10% \leq IBH <i>N</i> =292	20% \leq IBH <i>N</i> =69	3% \leq IBH <i>N</i> =564	5% \leq IBH <i>N</i> =410	10% \leq IBH <i>N</i> =275	20% \leq IBH <i>N</i> =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)
Directors' ownership (DO)	-1.97*** (85.92) <i>-0.44</i>	-1.73*** (40.71)	-1.34*** (16.52)	-3.70*** (7.86)	-0.65*** (11.73) <i>-0.30</i>	-0.62*** (15.58)	-0.27 (1.05)	-0.39 (0.86)	-1.13*** (25.00) <i>-0.33</i>	-0.96*** (11.14)	-1.18*** (15.28)	-1.21*** (7.15)
Board composition (BC)	0.86*** (27.92) <i>0.22</i>	0.74*** (25.35)	0.99*** (23.19)	0.51** (4.46)	0.57*** (10.85) <i>0.15</i>	0.59*** (8.55)	0.84*** (15.12)	0.79** (5.69)	0.67*** (14.98) <i>0.23</i>	0.62*** (8.59)	0.23* (2.84)	0.61 (2.61)
Firm size (FS)	-0.13*** (35.34) <i>-0.05</i>	-0.08*** (9.92)	-0.03 (2.00)	-0.09 (2.06)	-0.08*** (26.93) <i>-0.04</i>	-0.07*** (11.53)	-0.01 (0.08)	-0.02 (0.29)	-0.11*** (41.32) <i>-0.04</i>	-0.09*** (17.35)	-0.02 (0.50)	-0.04 (1.19)
Book-to-market (BM)	0.01 (0.33) <i>0.01</i>	0.02 (0.29)	0.04 (2.17)	0.03 (1.14)	0.08** (4.34) <i>0.01</i>	0.07 (2.69)	0.04 (0.76)	0.04 (0.29)	-0.00 (0.00) <i>0.00</i>	-0.01 (0.05)	-0.05 (1.36)	-0.14* (3.79)
ROA	-0.27 (2.19) <i>0.00</i>	-0.48** (5.72)	-0.64*** (7.22)	0.37 (0.73)	-0.06** (4.34) <i>0.08</i>	-0.05* (2.73)	-0.03 (0.77)	0.02 (0.00)	0.30* (2.91) <i>0.04</i>	0.35 (2.56)	0.31 (1.68)	0.29 (1.06)
Dividend yield (DY)	-0.92 (0.59) <i>0.00</i>	-1.02 (1.19)	-1.64 (1.72)	-3.81*** (7.39)	-0.39 (0.20) <i>-0.13</i>	0.02 (0.00)	0.38 (0.13)	-3.04* (3.11)	-4.89*** (15.18) <i>-1.39</i>	-6.82*** (18.97)	-7.29*** (15.99)	-4.82* (3.21)
Leverage (LEV)	0.33*** (7.63) <i>0.08</i>	0.27** (4.42)	0.17 (1.66)	-0.06 (0.18)	0.05 (0.18) <i>-0.03</i>	0.09 (0.38)	0.07 (0.17)	-0.58** (4.87)	0.02 (0.04) <i>-0.02</i>	0.00 (0.00)	0.08 (0.26)	-0.21 (1.16)
AGE	-0.04* (2.84) <i>-0.00</i>	-0.04* (3.10)	-0.02 (0.58)	-0.05 (1.83)	-0.04* (2.77) <i>-0.01</i>	-0.04* (2.31)	-0.06* (3.38)	-0.06 (1.39)	-0.09*** (13.78) <i>-0.01</i>	-0.12*** (13.74)	-0.11*** (10.06)	-0.09* (3.53)

(Continued)

Table 3. Continued.

Independent variables	1996				1999				2003			
	3% ≤ IBH N=674	5% ≤ IBH N=380	10% ≤ IBH N=267	20% ≤ IBH N=77	3% ≤ IBH N=577	5% ≤ IBH N=424	10% ≤ IBH N=292	20% ≤ IBH N=69	3% ≤ IBH N=564	5% ≤ IBH N=410	10% ≤ IBH N=275	20% ≤ IBH N=79
Volatility (VOL)	-0.80 (0.89) <i>-0.09</i>	-0.81 (0.74)	-2.42** (5.24)	-3.79** (5.23)	-0.41 (0.73) <i>-0.07</i>	-0.45 (0.64)	-0.09 (0.02)	-0.33 (0.07)	-0.10 (0.03) <i>-0.01</i>	-0.03 (0.00)	-0.08 (0.01)	-0.01 (0.00)
Liquidity (LIQ)	-0.06 (0.68) <i>-0.01</i>	-0.07 (0.85)	-0.12* (3.15)	-3.67*** (18.33)	-0.03* (3.79) <i>-0.03</i>	-0.02 (2.44)	-0.02* (2.95)	0.63 (0.28)	-1.00*** (25.63) <i>-0.07</i>	-1.39*** (26.16)	-2.48*** (31.25)	-2.34*** (13.11)
Beta	0.05 (0.57) <i>0.01</i>	0.11 (1.96)	0.18** (4.41)	0.25** (5.59)	0.06* (1.04) <i>0.02</i>	0.05 (0.49)	0.13* (2.80)	0.14 (1.45)	0.16** (4.76) <i>0.02</i>	0.18** (3.85)	0.17 (2.67)	0.18 (1.76)
Pseudo-R ² (%)	28.92	23.23	18.05	11.65	25.39	24.04	15.31	12.19	23.42	19.33	13.34	11.41

Note:

$$IBH = \alpha_0 + \alpha_1 DO + \alpha_2 BC + \alpha_3 FS + \alpha_4 ROA + \alpha_5 BM + \alpha_6 DY + \alpha_7 LEV + \alpha_8 AGE + \alpha_9 VOL + \alpha_{10} LIQ + \alpha_{11} BETA + \varepsilon \quad (1)$$

Institutional block-holding (IBH) 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 non-executive directors on the board; FS is measured by $\log(MV)$, where MV is the year end market capitalisation; BM ratio is measured at year end; ROA is income before interests, taxes, and depreciation/amortisation (EBITDA) divided by total assets; DY is calculated as dividend per share divided by year end share price; leverage is derived from total debt divided by total assets; AGE is the number of years that the company has been listed; volatility is the share return volatility derived from the standard deviations of monthly share returns in previous 24 months; liquidity is the average share turnover for previous 12 months, which is derived from average monthly trading volume divided by total outstanding shares issued; and beta is the company Beta derived from the market-adjusted model. The marginal effects of the variables are reported in italic. These are only reported for full samples (institutional block-holding $\geq 3\%$) for all the 3 years.

*Significance at 10% level for the χ^2 statistics test.

**Significance at 5% level for the χ^2 statistics test.

***Significance at 1% level for the χ^2 statistics test.

An interesting finding is that institutional block-holding is negatively associated with FS in all the cases, although the coefficients are only significant when the institutional block-holding thresholds are less than the 10% level. In other words, FS does not seem to matter for large institutional block-holders.¹² The association between institutional block-holding and BM is less clear cut. Growth prospects of a firm seem to have a limited effect on institutional block-holdings. The association between past ROA and institutional block-holding is also weak, although there is some evidence of UK institutional investors with small/medium block-holdings in firms with bad past financial performance in the years 1996 and 1999. Again past accounting performance does not seem to matter for large UK block-holders.¹³ Future research should further investigate the underlying reasons for this finding.

Previous studies suggest that DY is an important factor for institutional shareholding. Our result shows that institutional block-holding is negatively associated with DY for all the years. However, the coefficients are only significant when the institutional block-holding threshold is above the 20% level in 1996 and 1999. Interestingly, institutional block-holding is negatively associated with DY in all levels of block-holdings in 2003. This could be because of the abolishment of tax exemption on dividend income that was introduced by the FA97. The relationships between institutional block-holding and debt, institutional block-holding and volatility of share returns (or beta) are weak and cannot be generalised.

Finally, the results show a negative relationship between small/medium institutional block-holding and firm listing history and between large institutional block-holding and the liquidity of the firm. Large block-holders do not seem to care whether their investee firm has recently listed on a stock exchange or whether it has been trading on a stock exchange for a long time. The presence of institutional block-holders is negatively associated with the share trading liquidity of the firm. We think that there are some underlying reasons for a negative relationship between liquidity and block-holdings. First, pension funds and insurance companies,¹⁴ which do not trade as frequently as banks, mutual funds, etc., dominate the total institutional investments in the UK. Secondly, as discussed earlier, UK institutional block-holders prefer smaller firms that normally have lower share turnover than larger firms.

The regressions after considering the squared and cubic values of managerial ownership are reported in Table 4. We find that the model with DO^3 fits our data better than that with DO^2 in all 3 years in terms of higher pseudo- R^2 values. The coefficients of directors' ownership are significantly negative in all 3 years after controlling for non-linearity; the coefficients of DO^2 are significantly positive in all 3 years; and the coefficients of DO^3 are significantly negative in all 3 years. Therefore, we find support for our Hypothesis 2 in that the relationship between institutional block-holdings and directors' ownership appears to be non-linear. In other words, the substitute relationship between institutional block-holders dominates when directors' shareholding is low. The relationship reverses to be complementary when directors' shareholding is reasonably high and is eventually dominated by the substitute force again when directors' shareholding is very high. Other results are consistent with those reported in Table 3.

To further investigate the non-linear relationship between institutional block-holding and directors' ownership, we also use simulation data to provide the plots of the following three simplified models in Figure 4.

$$y = \begin{cases} 0.78 - 4.04x + 9.84x^2 - 9.60x^3 & \text{if } (x, y) \in \text{Firms1996} \\ 0.84 - 2.14x + 6.12x^2 - 6.48x^3 & \text{if } (x, y) \in \text{Firms1999} \\ 0.90 - 2.03x + 9.50x^2 - 17.88x^3 & \text{if } (x, y) \in \text{Firms2003} \end{cases}, \quad (4)$$

where y and x indicate the institutional ownership and directors' ownership, respectively.

Table 4. Results for the non-linear models (χ^2 statistics in parentheses).

Independent variables	IBH, 1996 (<i>N</i> = 674)		IBH, 1999 (<i>N</i> = 577)		IBH, 2003 (<i>N</i> = 564)	
	(2)	(3)	(2)	(3)	(2)	(3)
Intercept	-0.60***	-0.54**	-0.87***	-0.87***	-0.60***	-0.51**
Directors' ownership (DO)	-2.40***	-4.04***	-1.06**	-2.14**	-2.77*	-2.03**
Directors' ownership ² (DO ²)	0.91 (0.57)	9.84*** (7.53)	0.09 (0.66)	6.12* (3.83)	0.13 (0.04)	9.50** (4.01)
Directors' ownership ³ (DO ³)		-9.60**		-6.48*		-17.88***
Board composition (BC)	0.83*** (24.43)	0.82*** (23.59)	0.54*** (9.77)	0.53*** (8.82)	0.70*** (15.92)	0.67*** (14.93)
Firm size (FS)	-0.13***	-0.14***	-0.09***	-0.09***	-0.11***	-0.11***
Book-to-market (BM)	0.01 (100)	0.02 (0.40)	0.08** (95)	0.08** (96)	-0.00	-0.01
ROA	-0.25	-0.23	-0.06**	-0.06**	0.31* (63)	0.30* (3.00)
Dividend yield (DY)	-1.56	-1.41	-0.47	-0.51	-4.78***	-5.21***
Leverage (LEV)	0.33*** (7.59)	0.32*** (7.07)	0.05 (0.14)	0.05 (0.15)	0.04 (0.09)	0.03 (0.09)
AGE	-0.04*	-0.04*	-0.04*	-0.05*	-0.09***	-0.09***
Liquidity (LIQ)	-0.06	-0.05	-0.03**	-0.03**	-1.02***	-1.03***
Volatility (VOL)	-0.80	-0.69	-0.39	-0.41	-0.13	-0.07
Beta	0.05 (0.49)	0.05 (0.47)	0.07 (1.15)	0.07 (1.26)	0.16** (4.66)	0.15** (4.33)
Pseudo- <i>R</i> ² (%)	29.66	30.15	25.34	25.44	23.43	23.55

Note:

$$IBH = \alpha_0 + \alpha_1 DO + \alpha_2 DO^2 + \alpha_3 BC + \alpha_4 FS + \alpha_5 ROA + \alpha_6 BM + \alpha_7 DY + \alpha_8 LEV + \alpha_9 AGE + \alpha_{10} VOL + \alpha_{11} LIQ + \alpha_{12} BETA + \varepsilon \quad (2a)$$

$$IBH = \alpha_0 + \alpha_1 DO + \alpha_2 DO^2 + \alpha_3 DO^3 + \alpha_4 BC + \alpha_5 FS + \alpha_6 ROA + \alpha_7 BM + \alpha_8 DY + \alpha_9 LEV + \alpha_{10} AGE + \alpha_{11} VOL + \alpha_{12} LIQ + \alpha_{13} BETA \quad (2b)$$

where DO² and DO³ are the squared and cubic values of directors' ownership, respectively. The rest of the definitions are the same as in Table 1.

*Significance at 10% level for the χ^2 statistics test.

**Significance at 5% level for the χ^2 statistics test.

***Significance at 1% levels for the χ^2 statistics test.

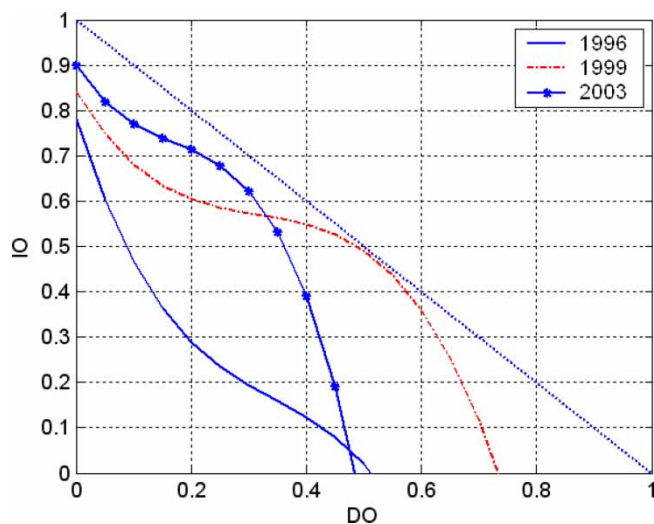


Figure 4. Simulation of non-linear relation between institutional ownership and directors' ownership.

Table 5. Results for the simultaneous equations using 3SLS for 2003 sample (two-tailed t -statistics in parentheses).

Independent variables	Dependent variables (2003, $N = 564$)		
	Institutional block-holding (IBH)	Directors' ownership (DO)	Board composition (BC)
Intercept	0.48* (1.91)	0.41*** (3.08)	0.29*** (3.25)
Institutional block-holding (IBH)		-0.09* (-1.83)	0.17*** (3.47)
Directors' ownership (DO)	-0.32*** (-5.55)		-0.09* (-1.74)
Board composition (BC)	0.23*** (4.23)	-0.10** (-2.36)	
Firm size (FS)	-0.04*** (-8.21)	-0.01*** (-2.87)	0.02*** (5.59)
Book-to-market (BM)	0.01 (25)	-0.01 (-0.53)	-0.01 (-0.72)
ROA	0.04 (0.75)	0.10** (2.46)	-0.02 (-0.47)
Dividend yield (DY)	-1.43*** (-3.66)	-1.13*** (-3.65)	-0.24 (-0.70)
Leverage (LEV)	0.01 (0.37)	0.00 (92)	0.00 (0.19)
AGE	-0.01* (-1.69)	-0.01** (-2.14)	-0.01 (-0.84)
Volatility (VOL)	-0.09 (-0.63)	0.02 (36)	0.32*** (3.04)
Liquidity (LIQ)	-0.07*** (-2.94)		
Beta	0.02* (1.61)		
Board size (BS)		-0.05* (-1.92)	
Sales growth (SG)		0.05** (2.68)	-0.01 (-0.68)
Split			0.05** (2.32)
CEO tenure			-0.01 (-0.58)
Adjusted R^2 (%)	23.27	16.51	23.65

Note: Sales growth (SG) is the change in sales compared with the previous year. Split is a dummy variable, which equals 1 for the separation of CEO and Chairman and 0 otherwise; and CEOTENUE is CEO's tenure, measured in the number of years. The rest of the definitions are the same as in Table 1.

*Significance at 10% level for the t -statistics test.

**Significance at 5% level for the t -statistics test.

***Significance at 1% level for the t -statistics test.

The intercepts (i.e. 0.78, 0.84, and 0.90) are the maximum institutional block-holdings in 1996, 1999, and 2003, respectively. All the regression coefficients were obtained from the estimated slope coefficients of models (2a) and (2b) (Table 4). For instance, the estimated slope coefficients of DO , DO^2 , and DO^3 for year 1996 are -4.04 , 9.84 , and -9.60 , respectively, which were derived from real company data. However, x , x^2 , and x^3 are simulation data of directors' ownership used to plot Figure 4.

Figure 4 shows that in all 3 years, institutional block-holding is negatively associated with directors' ownership. Institutional block-holding decreases more rapidly when directors' ownership is below 20% or above 40% than when institutional block-holding is between 20 and 40%. This indicates that institutional block-holding is significantly reduced in firms with a potential agency conflict (relatively small directors' ownership) and management entrenchment problems (relatively large directors' ownership).

As mentioned earlier, we also use three-stage least-squares (3SLS) simultaneous equations to deal with the endogeneity between institutional block-holding, directors' ownership, and board composition. We only report the results using the 2003 sample firms due to data availability for certain governance data. Table 5 shows that, consistent with the results reported in Tables 3 and 4, institutional block-holding is positively associated with board composition but negatively associated with directors' ownership, DY , FS , listing history,¹⁵ and liquidity. BM ratio, past ROA , leverage, and volatility are not significant. We also find that directors' ownership is negatively associated with institutional block-holding, board composition, DY , FS , age, and BS , but is positively associated with past ROA . BM ratio is not significant. As for the board composition, it is

Table 6. Results for changes-to-changes regressions.

Independent variables	Dependent variable (ΔIBH_t)			
	1996	1999	2003	All years
Intercept	0.09*** (2.71)	0.06*** (2.67)	0.04* (1.82)	0.00 (0.33)
ΔDO_t	-0.19*** (-2.69)	-0.12** (-2.25)	-0.11*** (-2.94)	-0.07** (-2.40)
ΔBC_t	0.02* (1.73)	0.03* (1.95)	0.04* (1.84)	0.05* (1.91)
ΔDY_t	0.00 (0.34)	-0.12* (-1.82)	-0.14** (2.59)	0.06 (0.82)
ΔROA_t	-0.07* (-1.74)	0.03 (0.66)	0.09*** (2.83)	0.03 (1.41)
ΔBM_t	-0.00 (-0.54)	-0.00 (-0.46)	-0.00 (-0.63)	-0.00 (-0.57)
ΔFS_t	-0.13*** (-3.59)	-0.06*** (-3.49)	-0.10*** (-3.61)	-0.09*** (-2.70)
ΔLEV_t	-0.02 (-1.18)	-0.00 (-1.11)	-0.00 (-1.41)	-0.00 (-1.29)
ΔLIQ_t	0.00 (0.63)	0.00 (0.55)	0.01 (0.61)	0.00 (0.34)
ΔVOL_t	-0.09 (-1.37)	-0.16 (-1.32)	-0.11 (-1.17)	-0.10 (-1.04)
Year dummy for 1996				0.01** (2.09)
Year dummy for 1999				0.00 (0.26)
No. of Obs.	654	545	447	1646
Adjusted R^2 (%)	5.82	4.72	6.20	3.40

$$\Delta IBH_{it} = \alpha_0 + \alpha_1 \Delta DO_{it} + \alpha_2 \Delta BC_{it} + \sum_{j=1}^{j=n} \alpha_{j+2} \Delta X_{ijt} + \varepsilon_t,$$

where ΔIBH_t is the change in IBH for period t ; ΔDO_t is the change in DO for period t ; ΔBC_t is the change in BC for period t ; and ΔX_{ijt} are the changes in other control variables except AGE and Beta.

*Significance at 10% level for the t -statistics test.

**Significance at 5% level for the t -statistics test.

***Significance at 1% level for the t -statistics test.

positively associated with institutional block-holding, FS, volatility, and split role of CEO and chairman of board, but is negatively associated with directors' ownership. Market beta (Beta) is positively associated with institutional block-holding; sale's growth is positively associated with directors' ownership; and CEO-chairman split is positively associated with board composition. CEO tenure is not associated with board composition. In summary, the above results confirm that institutional block-holding and board composition are complementary control mechanisms, but institutional block-holding and directors' ownership are substitute control mechanisms.

To examine whether the above results are biased due to omitted variables in regression analysis, we use the change-to-change model as a robustness test. Table 6 reports that changes in institutional block-holding are negatively associated with changes in directors' ownership, but are positively associated with changes in board composition. Changes in board composition are only marginally associated with changes in institutional block-holding, which could be caused by the fact that board composition does not change much throughout the test period. We also run a regression combining all the sample years. The results are consistent with those reported for 3 separate sample years.

6. Conclusions

This study examines the extent to which directors' ownership and board composition affect the level of institutional block-holding in the UK. We find consistent evidence that institutional block-holdings are positively associated with board composition, but are negatively associated with directors' ownership after controlling for firm characteristics. This finding is robust even after controlling for the endogeneity between certain governance control mechanisms. Overall, our results indicate that higher directors' ownership is perceived by UK institutional block-holders as a substitute corporate control mechanism, whereas independent board composition is considered as a complementary control mechanism. We also find a non-linear relationship between institutional block-holding and directors' ownership. Another important finding of this study is that institutional investors' preference to firm characteristics changes over time. We find that institutional block-holding is negatively associated with DY for all the ownership thresholds in 2003, whereas its association with DY is generally insignificant in 1996 and 1999. This indicates that the introduction of the Financial Act 1997, which abolished the tax exemption on dividend income, has significantly changed the investment preferences of UK institutional investors. This study also provides evidence that UK institutional block-holders generally prefer smaller firms and firms with a shorter trading history on a stock exchange.

The main limitation of this study is that we are unable to examine whether investment preferences of UK institutional block-holders are conditional on different types of institutional block-holders because most UK institutional investors engage in various businesses. Previous studies (e.g. Del Guercio 1996; Nielsen 2004) have documented that institutional investors are heterogeneous in nature and may have different investment preferences. We believe that this deserves to be separately examined in future research when data are more widely available in the UK.

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Notes

1. Similar arguments have been made by Morck, Shleifer, and Vishny (1988), McConnell and Servaes (1990), and Short and Keasey (1999).
2. The inconsistency in finding the investment preferences of institutional investors is mainly caused by various data sources, time periods, and regulatory requirements across countries in previous studies.
3. This study examines the investment preferences of the institutional 'block-holders' in the UK, which could be very different from US studies that examine the investment preferences of 'entire' institutional shareholders. Hence, the finding of this study may not be directly comparable to US studies. Also, the economic and regulatory environment of UK and USA could be very different. For example, US institutional investments have been regulated under the 'Prudent-Man' law since 1970s. UK institutional investments, however, did not have similar regulation until the Myner's Report was released in 2001 (Myner 2001). In addition, UK institutional investors are believed to be more passive than their US counterparts in terms of the usage of their voting rights or raising proposals when their investee firms' corporate governance is poor. More importantly, the UK and the USA have very different legal environment as it is very rare that UK investors sue their investee companies.
4. We also use the OLS model and find results that are qualitatively and quantitatively similar to those from the Tobit model.
5. The above thresholds are also used by some previous studies (e.g. Agrawal and Mandelker 1990; Stapledon 1996).
6. We only report the results of three-stage instead of two-stage simultaneous regressions because the estimators from the former method are consistent and asymptotically more efficient than those from the latter method.
7. Before the FA97, pension funds and insurance companies were exempt from dividend income tax. According to the tax clientele theory, pension funds and insurance companies should have investment preference for firms with a higher DY before 1997. However, as the tax exemption on pension funds and insurance companies was formally abolished in 1997 and 1999, respectively, the high dividend payout policy may have become unattractive to institutional investors.
8. We report the results by year in order to see the pattern of the association between institutional block-holding and other governance control mechanisms across 3 years (covering both the Cadbury Report and Higgs Report). We have also run a panel regression with year dummies to control for systematic annual effects and found that the conclusions on directors' ownership, board composition, and firm age are consistent with those from cross-sectional analyses. The coefficient of FS is significant across all the block-holding thresholds, whereas in the Tobit regressions, it was only significant for lower levels of institutional block-holdings. Panel regression results are available from the corresponding author on request.
9. We report the marginal effects only for the full sample ($IBH \geq 3\%$) for all the 3 years. They are reported in italic. The marginal effects for other threshold samples are similar.
10. The regression results of these two subsamples are not reported here but are available from the corresponding author upon request.
11. This finding remains qualitatively consistent when we include all 3-year data in one regression with year dummies.
12. This finding is different from the predictions that (1) holding a significant amount of the outstanding shares of large companies could be very costly, and institutional block-holders may invest more in smaller companies; (2) it is certainly more difficult to own a significant amount of the outstanding shares of large than small companies; and (3) small firms may have more serious agency problem and therefore need to be monitored by external institutional broker-holders.
13. The unreported results show that share return is also a weak determinant of institutional block-holding.
14. 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 long-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.
15. There are three potential reasons for this finding. First, younger firms may have a greater agency conflict and therefore need to be monitored by external control mechanisms such as institutional block-holders. Secondly, institutional block-holders prefer younger firms because they may have lower management entrenchment. Finally, younger firms may have higher future growth.

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