РАЗДЕЛ 2
КОРПОРАТИВНАЯ СОБСТВЕННОСТЬ

SECTION 2
CORPORATE OWNERSHIP

INTERPLAY AMONG THE LARGE INVESTOR GROUPS AND THE OWNERSHIP-PERFORMANCE RELATIONSHIP

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Abstract

This paper applies several methodologies to examine the interplay among large shareholders. We find that firm performance is positively associated with insider and institutional ownership, but negatively associated with blockholder ownership. More importantly, we find that insider and institutional ownership are negatively related to each other, functioning as substitutes. However, they are both positively related to blockholder ownership, indicating that the endogenous optimal ownership requires higher insider and/or institutional ownership when there is high blockholder ownership. Methodologically, we find that using residual ownership reduces or eliminates spurious variations in the non-linear relationship between firm performance and insider ownership, and industry adjustment generates more reliable estimates. This paper sheds light on the complex interplay among these various types of large investors.

Keywords: Corporate Governance, Ownership, Performance, Investors

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1. Introduction

While the relationship between corporate ownership structure and firm performance has been extensively studied, empirical evidence has been mixed. Jensen and Meckling (1976) and Stulz (1988), among others, argue that the ownership structure of a firm affects its performance. Others argue that if the ownership structure is endogenously determined, then it should not affect firm performance: that either (1) ownership structure is an endogenous outcome reflecting shareholder influence (Demsetz 1983), or (2) the proper functioning of outside mechanisms such as the managerial labor market, the product market, and the takeover market, reduces the importance of ownership structure as it relates to firm performance.

Many empirical studies on ownership structure and firm performance treat ownership as a one dimensional factor by focusing only on insider ownership. Although institutional and blockholder ownership have been included in some studies, they do not consider the interaction among the different types of ownership.[10]

[10] In their study of firm performance and mechanisms to control managerial agency problems based on Forbes 800

This paper investigates the relationship between firm performance and the structure of different types of equity ownership. We incorporate insider and institutional ownership as well as blockholder ownership and consider their interaction.

In the US, institutional investors hold a substantial portion of publicly traded equity capital.[11] In recent years, institutional investors have become increasingly vocal in commenting on firm's managerial and operating decisions—acting as investor activist on behalf of he investor general public. Understanding and evaluating the roles of institutional investors and blockholders, in addition to insiders, on firm performance, and in particular the interaction between institutional investors and blockholders, is therefore a timely issue.

We follow the seminal paper by Morck, Shleifer and Vishny (1988) anduse Tobin's q as proxy for firm valuation. We examine the effects of different stakeholders on firm performance, and firm performance on them, using 2-Stage-Least-Square (2SLS) within a set of simultaneous equations. Our study presents new evidence on (1) whether insider ownership affects firm performance, (2) what kind of roles institutional investors and blockholders exert in corporate governance, and (3) how firm performance affects different kinds of large shareholdings.

Overall, we find little evidence that insider ownership affects firm performance, implying that insider shareholding is endogenous and thus has no cross-sectional valuation effect.[12] Confirming earlier studies, we find that institutional holdings areassociated with higher firm value, reflecting their positive monitoring effect. In addition and in particular, we find strong evidence that blockholder ownership is negatively associated with firm valuation. This contrasts to the role played by institutional investors, providing evidence that the existence of blockholders neither improves firm performance nor protects outside minority shareholders.

Investigating the relationship from the opposite direction, we find strong evidence that improvement in firm performance is associated with an increase in insider and institutional shareholdings, while negatively associated with blockholder shareholdings. This again highlights the different motivations between insiders and institutional holders on the one hand, and blockholders on the other hand.

The paper is organized as follows. Section 2 describes our data and variables. Section 3 contains the empirical methodology. Section 4 presents the empirical results and Section 5 concludes.

2. Data and variable descriptions

2.1 Data Selection

To be in our sample, a firm must be contained in COMPUSTAT, CRSP and COMPUSTAT Disclosure CD-ROM simultaneously. The final sample is constructed through the following procedures:

1. Excluding firms in the finance (SIC 6000 to 6999) and utility (SIC 4900 to 4999) industries;
2. Excluding firm with missing information on ownership or with the percentage ownership reported exceeding 99.9;
3. Excluding firms whose insider ownership, institutional ownership, and blockholder ownership simultaneously equal zero;[13]
4. Excluding any firms with Tobin's q less than zero or greater than 10;[14]
5. Following MacKie-Mason (1990), we assume a firm's expenditure on advertising, or research & development is zero if they are missing;[15]
6. Deleting firms with missing information on any other variables used in our analysis.
7. The final sample contains 27,475 firm-year observations of 6,479 firms from 1987 to 1998.

firms in 1987, Agrawal and Knoeber (1996) treat firm performance and six mechanisms (including shareholdings of institutions, and large blockholders) as endogenous by using 2SLS within a simultaneous system. Our study differs in sample selection, utilization of a simultaneous system methodology, and most importantly in our results.

[11] Brancato (1997) estimates that institutional ownership of domestic equities increased from $1.6 trillion in 1980 to $10.2 trillion in the second quarter of 1995. Institutions accounted for over 50% of the aggregate equity market value in 1995.

[12] If insider shareholdings are determined cooperatively by a firm's decision-makers, the level of insider ownership should reflect all costs and benefits, leading to firm value-maximization. The cross-sectional regression reflecting differences in firm's underlying environment should not find a relation between firm performance and insider ownership. However, since shareholdings of large outsiders (e.g.,institutional investors and blockholders) are independently determined by those outsiders, who need not be firm value maximizers , their ownershipmay be related to the underlying environment. Additionally, there may be cross-sectional evidence of institutional/blockholder ownership on firm performance.

[13] Including such firms does not qualitatively change the results.

[14] including firms with q>10 does not qualitatively change the results.

[15] Firms usually do not report their R&D (xrd) and advertising expenditures(xad) if their expenses on R&D or advertising are not material. .MacKie-Mason (1990) indicates that assuming xrd/xad equal to zero if they are missing does nott lead to any significant bias.

2.2 Variable Definitions and Descriptions

Table 1 presents our variable definitions.

Table 1. Variable Descriptions and Definitions

A variable name with "a" as the initial character means that the variable value is adjusted by the mean value of samples within the same industry and size group. The industry and size adjusted value is obtained through the following procedure: we first assign a firm to an industry according to its 4-digit primary sic code at the end of calendar year (from CRSP), if there are less than 10 firms under the 4-digit sic code, we then use 3-digit sic code or even 1-digit sic code, until there are at least 10 firms under each industry code. Then we divide firms within the same industry into three groups, small, middle and large according to the book value of total assets. The small (large) group under an industry contains the smallest (greatest) 30 percent firms, and the middle group contains firms whose sizes (book value of total assets) belong to the middle 30 to 70 percent. Then a firm's industry-size adjusted value of a variable is equal to the value of the variable minus the median value of the variable of firms in the same industry and size group.

variable	Definition
q	Tobin's Q=[Market value of equity + Preferred stock liquidating value + Long term debt – (Current assets – Current liabilities)] / (Total assets)
ins	% of common shares held by insiders
ins^2	The square of insider ownership
ins^3	The cube of insider ownership
int	% of common shares held by institutional investors
blo	% of common shares held by blockholders
ta	Book value of total assets
ltdta	The ratio of long-term debt to total assets
xrdta	The ratio of research and development expenditures to book value of total assets
xadta	The ratio of advertising expenditures to TA
cape	The ratio of capital expenditures to the stock of property, plant and equipment. CAPX-capital expenditures, PPENT-the total net value of property, plant and equipment
ebita	The ratio of earnings before interests and taxes (ebit) to book value of total assets, TA.
beta	Market risk, measured by the coefficient of a firm's weekly stock return regressed on weekly NYSE/AMEX/NASDOQ value-weighted return in 1998
sdr	Firm specific risk, measured by the standard error of the residuals of the above regression
trat	Total trading volume turnover, the ratio of calendar year end trading volume to common shares outstanding at the end of a calender year
tat	Total assets turnover, measured by net sales divided by book value of total assets
cr	Current ratio, measured by total current assets divided by total current liability

Morck, Shleifer and Vishny (1988) were the first to use Tobin's q as a measure of firm performance. Most subsequent studies also use Tobin's q as measure of firm performance. Earlier studies (Demsetz and Lehn, 1985) used the accounting rate of return. To make our results comparable to most others, we use Tobin's q as measure of firm performance.

Originally, Tobin's q is defined as the ratio of market value of a firm (including intangible assets) to the replacement costs of its tangible assets. Tobin's q and accounting rates of return are correlated, but their focus and constraints are different. Demsetz and Villalonga (2001) discuss conceptual issues on using Tobin's q and accounting rates of return as alternative measures of firm performance. Tobin's q is forward-looking, reflecting investors' anticipation on what the firm is expected to achieve. In contrast, accounting rates of return are historic, measuring what the firm has accomplished in the past. They are not affected by investor psychology, but by accounting standards and practices. Since it is often difficult to estimate the replacement costs of tangible assets, many studies instead use the book value of tangible assets to compute the denominator of Tobin's q. Tobin's q computed this way is therefore affected by accounting practices to some degree. We follow the methodology in Chung and Pruitt (1994), and Pantzalis (2001) to compute Tobin's q. The resulting approximation to the original Tobin's q is simpler to compute and is highly correlated with the original q.

Following the literature, we use BETA to proxy for the market risk of a firm, and we use the standard deviation of the residuals in the following market model to proxy for firm specific/ideosyncratic risk:

$$RET_{it} = \alpha_0 + BETA_i * RMKT_{it} + \varepsilon_i \quad (1)$$

Where $RET_{it}$is the weekly stock returns of a firm in 1998, and $RMKT_{it}$ is the NYSE/AMEX/NASDOQ value-weighted index returns. ***sdr*** is the standard deviation of the residuals in the market model, and ε is the residual.

Other variables are calculated in a straightforward manner, as described in the table.

2.3 Summary Statistics

Table 2 contains summary statistics of the key variables, by industry (2-digit SIC) and in aggregate.

Table 2. Summary Statistics

Mean values of total assets, Tobin's q and different kinds of ownership based on 2-digit SIC code at the end of calendar year from CRSP.

2-digit SIC	N	ta ($Mil)	q	ins (%)	int (%)	blo (%)
10	351	794.611	1.50743	10.253	24.233	23.709
11	23	726.12	1.74397	24.156	17.758	23.051
12	68	1130.416	0.96157	13.899	34.799	32.493
13	974	1512.715	1.14184	18.549	35.322	30.079
14	37	728.381	1.26603	16.033	25.328	17.708
15	25	354.650	0.88241	34.874	16.649	32.246
16	136	539.915	0.93033	24.442	27.183	37.179
17	89	184.880	0.87070	34.353	24.838	38.560
18	24	321.761	1.07119	28.104	30.836	35.11
19	1	231.6	6.47675	0	2.16	65.42
20	774	2032.617	1.34990	19.764	28.387	31.082
21	20	1665.405	4.02375	4.122	38.284	13.757
22	232	364.371	0.67972	22.488	38.531	38.010
23	294	355.515	0.79308	23.158	34.126	30.339
24	180	1561.054	0.79925	22.362	34.071	27.841
25	225	303.742	0.89129	25.649	29.758	31.396
26	381	2678.109	1.11876	10.457	42.439	20.307
27	580	1061.976	1.40998	17.822	40.706	35.060
28	2243	1237.852	2.12061	17.522	32.150	29.137
29	186	7959.865	1.09602	12.916	40.05	25.849
30	418	568.654	1.08260	19.926	31.124	32.261
31	110	458.493	0.92012	15.252	39.193	34.047
32	290	602.440	0.89301	18.456	31.220	31.101
33	612	1093.75	0.72385	15.742	43.229	31.489
34	806	594.010	0.86983	17.242	34.974	32.951
35	2497	1083.984	1.15520	18.243	34.275	31.172
36	2895	564.157	1.38732	19.849	30.359	29.668
37	586	1987.256	0.85240	21.192	34.437	30.632
38	2005	536.303	1.65359	20.770	26.199	30.803
39	458	255.531	0.87898	25.273	27.830	37.985
40	87	2236.261	0.90321	18.917	30.972	29.663
41	22	1317.51	1.23365	12.391	44.973	26.753
42	316	245.554	1.03467	32.994	32.026	38.731
44	92	994.792	0.96726	14.819	41.898	35.843
45	208	2352.339	1.03233	15.852	35.035	38.454
47	59	316.526	1.29421	31.449	39.841	49.614
48	586	4313.472	1.74874	21.703	28.195	33.902
50	955	280.641	0.95645	24.857	30.484	35.758
51	593	682.345	1.14279	25.105	28.464	34.720
52	81	640.892	0.95055	31.356	24.943	34.149
53	223	4095.775	1.07172	20.467	47.449	35.782
54	178	1297.624	1.24747	26.427	29.689	31.806
55	95	282.451	0.84084	28.297	23.250	38.985
56	317	408.170	1.36657	28.231	37.980	38.178
57	226	359.693	0.72075	25.986	35.849	34.891
58	520	500.084	1.49498	25.273	29.887	37.888
59	657	493.672	1.20361	26.119	36.304	41.168
70	165	709.563	1.26524	20.517	33.892	39.679
71	9	1158.049	1.05409	19.197	49.27	23.894
72	146	847.904	1.76498	19.910	40.651	33.977
73	2350	313.049	2.02731	25.537	31.286	34.735
74	8	133.7	1.15543	24.34	20.85	34.39
75	70	1017.991	1.22918	20.672	32.997	37.003
76	35	344.591	1.28878	21.305	32.821	25.700
78	134	712.071	1.38672	20.188	24.914	33.769
79	198	399.955	1.53147	26.229	22.401	33.456
80	749	304.082	1.60677	22.792	29.201	33.428
81	4	21.465	2.36324	13.54	2.1	22.663
82	86	173.374	1.82966	26.254	30.644	35.805
83	56	576.166	1.34796	33.738	34.342	36.897
86	11	89.234	0.60964	7.882	14.444	36.464
87	559	137.730	1.84215	22.930	25.628	32.144
89	147	131.316	1.25158	24.351	25.154	38.990
91	2	222.2	0.86728	20.92	19.15	23.84
92	1	41.76	0.28161	0	9.51	25.47
94	1	29.88	1.21825	55.7	3.87	58.57
95	3	2167.93	1.27488	14.083	38.673	35.51
96	2	61.505	0.61559	6.235	18.04	66.635
99	4	297.708	1.83078	22.013	23.743	36.855
average	398.188	930.423	1.30477	21.035	30.018	33.864
stdev	621.681	1200.489	0.81400	8.453	9.702	8.668

The mean value of Tobin's q is 1.3. On average, insiders, institutional investors, or blockholders respectively hold 21, 30 and 34 percent of the total common shares outstanding.

2.4 Industry Adjustment

The industry and size adjusted value is obtained through the following procedure: a firm is assigned to an industry according to its 4-digit primary sic code. If there are less than 10 firms under the 4-digit sic code, we use 3-digit sic code, and so on, until there are at least 10 firms under each industry code. Firms within the same industry are then divided into three groups, small, middle and large according to the book value of total assets (***ta***). The small (large) group in an industry contains the smallest (largest) 30 percent of firms. The middle group contains firms whose sizes (book value of total assets) belong to the middle 30 to 70 percent. A firm's industry-size adjusted value of a variable is equal to the value of the variable minus the ***median***value of the variable of firms in the same industry and size group.

Using Welch's t- (Wilcoxon rank-sum z-) statistic as the mean (median) difference test statistic, we find strong evidence of significant differences in firm performance (industry-adjusted Tobin's q, or ***aq***) between firms with different industry adjusted ownership holdings (insiders, institutional investors, and blockholders). In particular, for firms with high industry-adjusted performance (***aq***), mean insider ownership is higher, mean institutional is higher, while mean blockholder ownership is lower.

3. Methodology

3.1 A Set of Simultaneous Equations

Many theoretical studies predict that ownership affects firm performance.[16] Conversely, other studies have found that firm performance affects insider ownership (Loderer and Martin, 1997; Cho, 1998; and others). Different types of ownership may also affect each other. Leland and Pyle (1977) argue that insider shareholding is a signal of the quality of a firm and that consequently, insider ownership may affect institutional and blockholder ownership. However, if we assume institutional investors and blockholders are effective monitors and share common interests with atomistic shareholders, then less insider shareholding is needed to align insiders' interests with those of outside shareholders. Furthermore, managers may have less incentive to hold higher stakes since the benefits of shirking are decreased as the result of effective monitoring by institutional investors and blockholders. It is also possible that institutional investors or blockholders, or both, are not good monitors in other ways. Even though they monitor well, they might act for themselves or collude with insiders. In the latter case, minority shareholders are in a disadvantaged situation, and firm performance/market valuation on such firm may go down. In any case, it is highly likely that different types of ownership and firm performance interact in game-theoretical fashion and affect the choices of the other stakeholders. It is this potentially complex set of interaction that we examine empirically.

In equations (2) to (6), we follow Morck, Shleifer, and Vishny (1988) and other studies in using ***ltdta***, ***xrdta*** and ***xadta*** as explanatory variables to examine the effect of insider ownership on firm performance. Following Pantzalis et. al. (2002), we use earnings before interests and taxes as another control variable. However, we use ***ta*** to standardize those variables. We follow Himmelberg, Hubbard, and Palia (1999) in using the investment rate, ***cape***, the ratio of capital expenditure to the net stock of plant, property, and equipment, to control for effect of capital expenditure on firm performance. Previous studies document significant non-linear effects of insider ownership on firm performance (see McConnell, and Servaes, 1990; Morck, Shleifer, and Vishny 1988, Hermalin and Weisbach 1991). We follow Short and Keasey (1999) in using the cubed model of insider to control for the non-linearity. Following Himmelberg, Hubbard, and Palia (1999), we also consider effects of market risk (***beta***) and firm-specific risk (***sdr***) on firm performance in some regressions.

[16] For research on insider ownership and firm performance see Jensen & Meckling (1976), Stulz (1986) and others. For research on institutional ownership and firm performance see Gorton and Kahl (1999), Pound (1988) and others. For research on blockholder ownership and firm performance see Shleifer and Vishny (1986) and (1997).

$$q_i = f(ins_i, ins\text{^}2_i, ins\text{^}3_i, \text{int}_i, blo_i, ta, xrdta_i, xrdta_i, ltdta_i, cape_i, ebita_i, beta_i, sdr_i) + \varepsilon_{qi} \quad (2)$$

$$own_i = f(q_i, otherown_i, ta, xrdta_i, xrdta_i, ltdta_i, cape_i, ebita_i, beta_i, sdr_i, tat_i, cr_i, trat_i) + \varepsilon_{oi} \quad (3), (4), (5), \text{and } (6)$$

where

own_i= ins_i, int_i, or blo_i, and

$otherown_i$= other kinds of ownership except own_i

Following Himmelberg, Hubbard, and Palia (1999), we use ***xrdta***, ***xadta***, ***ltdta***, ***cape***, ***beta***, ***sdr***, and ***ebita*** as independent variables to explain insider ownership. Our methodology differs in our use of book value of total assets instead of sales as a proxy for firm size, and our use of total assets to standardize the variables, except for ***beta*** and ***sdr***.

Gompers and Metrick (2001) show that large institutions prefer larger and more liquid stocks. We use ***trat***, or trading volume turnover, the ratio of calendar year trading volume to shares outstanding at the end of a year, as a proxy for liquidity to measure its effect on institutional ownership. McConnell and Wahal (1998) document a positive effect of R&D expenditure on institutional ownership, therefore we also include the ratio of R&D expenditure to book value of total assets as an explanatory variable on institutional ownership. We expect a positive effect if, by their monitoring, institutional investors prevent managers from making myopic cuts in R&D expenditures.[17] In their test of the prudent investment hypothesis in institutional portfolio composition, Eakins, Stansell, and Wertheim (1998) document significantly positive effects of market risk (***beta***), current ratio (***cr***), profitability (ROA, we use ***ebita***) and trading volume turnover on institutional ownerships. We expect these variables to affect blockholder ownership in somewhat similar ways. Crutchley et. al. (1999) find a U-shape effect of insider ownership on institutional ownership. Most importantly, we anticipate that different kinds of ownership affect each other. To better compare these connected determinants, we use equations (3) to (6) to endogenously estimate the interactions between the various types of ownership.

3.2 Empirical Estimation

We first run a series of OLS regressions for the pooling data using White's robust estimator to control for heterogeneity of residuals (White, 1980). The residuals of pooled time-series, cross-sectional data are likely to be correlated over time, potentially leading to inflated T-statistics; we correct for this by running OLS robust regressions year by year. We then compute the average coefficients of independent variables. We compute different test statistics to assess whether a coefficient is significantly different from zero. We follow Chung (2000) and use the chi-square test outlined in Gibbons and Shanken (1987), as well as the z-statistic outlined in Meulbroek (1992). We also use the t-statistic from Fama and MacBeth (1973).

OLS regressions do not control for the correlations of residuals between different equations (in this case, the correlation between ε_{qi} and ε_{oi}). To eliminate interaction effects between firm performance and ownership (the endogeneity problem), we adopt the seemingly unrelated regression methodology (SUREG) (Zellner, 1962), which should lead to more efficient estimates than would be obtained by running the models separately. We run SUREG for the pooled data and also year by year, and then aggregate the coefficients. The Breusch-Pagan test of independence for the pooling data and each of the yearly SUREG all reject the assumption of no correlations between residuals of different equations, confirming that SUREG results are more efficient than OLS results.

We also follow Himmelberg, Hubbard, and Palia (1999) in using a fixed effects model to control for the effects of unobserved factors on firm performance and shareholdings. Without this, the relationships between firm performance and shareholdings may be spurious as the result of common unobserved firm characteristics. In addition, we also use two-stage fixed effects to control for the potential endogeneity of firm performance and insider ownership. Currently, panel data methodology does not enable us to control for the endogeneity between firm performance, insider ownership, institutional ownership, and blockholder ownership. However, the aggregation of the yearly SUREG coefficients corrects for any potential issues that may arise from this.

3.3 Controlling for Potential Overlap in Different Ownership Groups

To control for potential overlaps between the different ownership groups, we use residual ownerships as described below to repeat the analyses.

Residual insider ownership, residual institutional ownership, and residual blockholder ownership (***reins***, ***reint***, and ***reblo***) are residuals from the following regressions:

[17] Previous findings on the effect of R&D expenditure on institutional ownership are mixed.

$$ins_{it} = \alpha_0 + \alpha_1 int_{it} + \alpha_2 blo_{it} + \varepsilon_{it.} \quad (7)$$
$$int_{it} = \beta_0 + \beta_1 ins_{it} + \beta_2 blo_{it} + \mu_{it.} \quad (8)$$
$$blo_{it} = \delta_0 + \delta_1 ins_{it} + \delta_2 int_{it} + \nu_{it.} \quad (9)$$

In general, most of our results are robust to all the different methods.

4. Empirical Results and Discussions

Because our key interests are in the relationship among firm performance and different types of ownership, we do not discuss effects of control variables unless necessary.

4.1 OLS and SUREG Results from Pooling Data

Table 3 reports the OLS results. Panel A shows industry adjusted results; Panel B shows unadjusted results. Table 4 reports the SUREG results similarly, with Panel A containing the results without the industry adjustment, and Panel B the results with the industry adjustment.

The SUREG results in Table 4 broadly agree with the OLS results in Table 3. Both insider and institutional ownership positively affect firm performance, while blockholder ownership has a negative effect on firm performance. From the opposite direction, firm performance positively affects insider and institutional ownership, while negatively affecting blockholder ownership. The same pattern is evident with and without industry adjustment, for both the OLS and SUREG results.

With regard to the non-linearity issue in insider holding, only the industry adjusted regressions (both the OLS and the SUREG) are significant. The coefficient for the squared insider holding variable is positive and statistically significant. The coefficient for the cubed insider holding variable is negative and statistically significant. This indicates a significant curvilinear relationship as suggested by Stulz (1988), and found in differing degrees by Morck, Shleifer, and Vishny (1988), Kim and Lyn (1988), and McConnell and Servaes (1990).

Table 3. OLS Pooling Regressions

Panel A: variables are not adjusted by industry and size

independent variable	dependent variable								
	q (1)	q (2)	q (3)	ins (3)	ins (4)	int (5)	int (6)	blo (7)	blo (8)
intercept	.977[a]	.984[a]	.990[a]	.231[a]	.204[a]	.313[a]	.313[a]	.240[a]	.217[a]
q				.0086[a]	.0100	.0065[a]	.0066[a]	-.0088[a]	-.0064[a]
ins	.391[a]	.310[a]	.147			-.345[a]	-.332[a]	.320[a]	.319[a]
ins^2		.120	.709						
ins^3			-.505						
int	.445[a]	.444[a]	.445[a]	-.299[a]	-.291[a]			.113[a]	.129[a]
blo	-.226[a]	-.225[a]	-.226[a]	.201[a]	.199[a]	.094[a]	.092[a]		
ta	3.46 e-06[b]	3.30 e-06[b]	3.15 e-06[b]	-3.49 e-06[a]	-3.30 e-06[a]	7.15 e-06[a]	6.05 e-06[a]	-6.28 e-06[a]	-6.55 e-06[a]
ltdta	-.609[a]	-.610[a]	-.610[a]	-.008	-.002		.045[a]		.095[a]
xrdta	3.686[a]	3.687[a]	3.689[a]		-.025[c]	-.267[a]	.089[a]		.005
xadta	-.0004	-.0007	-.0008		-.0005		-.004[b]		-.004[a]
ebita	.174[b]	.175[b]	.175[b]	.071[a]	.052[a]		.277[a]		-.034[a]
cape	.518[a]	.518[a]	.518[a]		.020[b]		-.025[a]		.014[b]
tat					.016[a]		-.011[a]		.004[b]
cr					9.22 e-05		-.004[a]		-3.43 e-04
trat					-.002[a]	.044[a]	.041[a]		-.007[a]
beta				-1.09 e-04[c]	-1.10 e-04[c]	-7.41 e-06	1.83 e-06	-1.25 e-04	-1.25 e-04
sdr				1.58 e-04	1.51 e-04	-6.55 e-03[a]	-5.91 e-03[a]	-5.05 e-03[a]	-5.25 e-03[a]
R^2	.132	.132	.132	.177	.181	.190	.247	.083	.089
Model F-stat	148.5[a]	133.8[a]	121.6[a]	746.6[a]	438.7[a]	579.8[a]	393.3[a]	287.5[a]	137.2[a]
Total N	27475	27475	27475	27475	27475	27475	27475	27475	27475

a: significant at 1%
b: significant at 5%
c: significant at 10%

Panel B: Variables (except ta) are adjusted by industry and size

independent variable	dependent variable								
	aq (1)	aq (2)	aq (3)	ains (4)	ains (5)	aint (6)	aint (7)	ablo (8)	ablo (9)
intercept	.242[a]	.236[a]	.229[a]	.041[a]	.041[a]	.011[a]	.016[a]	.008[a]	.006[a]
aq				.010[a]	.010[a]	.010[a]	.008[a]	-.008[a]	-.006[a]
ains	.416[a]	.353[a]	.422[a]			-.204[a]	-.204[a]	.310[a]	.306[a]
ains^2		.221[c]	.540[a]						
ains^3			-.719[b]						
aint	.574[a]	.576[a]	.578[a]	-.262[a]	-.255[a]			.120[a]	.143[a]
ablo	-.244[a]	-.244[a]	-.245[a]	.223[a]	.221[a]	.080[a]	.083[a]		
ta	-3.10 e-06[a]	-2.95 e-06[a]	-2.75 e-06[a]	-1.44 e-06[a]	-1.45 e-06[a]	-1.34 e-06[a]	-1.56 e-06[a]	-1.76 e-06[a]	-1.70 e-06[a]
altdta	-.397[a]	-.398[a]	-.399[a]	.008	.009		-.075[a]		.072[a]
axrdta	2.964[a]	2.964[a]	2.966[a]		-.027[c]	.013	.141[a]		.020
axadta	.025	.0025	.025		-.001		-.001		-.003[a]
aebita	.319[a]	.320[a]	.321[b]	.050[a]	.041[a]		.114[a]		-.016[b]
acape	.388[a]	.388[b]	.388[b]		.011[c]		.0002		-.003
atat					.005[b]		-.0006		.002
acr					-1.56 e-04		5.75 e-05		-1.80 e-04
atrat					-.006[a]	.031[a]	.030[a]		-.014[a]
abeta				-1.40 e-04[b]	-1.38 e-04[b]	-3.64 e-05	-3.10 e-05	-7.10 e-05	-6.89 e-05
Asdr				-1.93 e-04	-2.23 e-04	-3.14 e-03[a]	-2.75 e-03[a]	-4.27 e-03[a]	-4.42 e-03[a]
R^2	.069	.069	.069	.120	.121	.102	.122	.075	.082
Model F-stat	85.4[a]	78.0[a]	72.2[a]	331.7[a]	192.3[a]	243.0[a]	170.7[a]	269.6[a]	132.7[a]
Total N	27475	27475	27475	27475	27475	27475	27475	27475	27475

a: significant at 1%
b: significant at 5%
c: significant at 10%

Table 4. Seemingly Unrelated Regressions (SUREG) on the Pooling Data

Panel A: variables are not adjusted by industry and size

Independent variables	Dependent variables			
	q	ins	int	Blo
intercept	0.8326[a]	0.2073[a]	0.3110[a]	0.1182[a]
q		0.0199[a]	0.0204[a]	-0.0174[a]
ins	0.6408[a]		-0.6141[a]	0.6110[a]
ins^2	0.8145			
ins^3	-0.5757			
int	0.9433[a]	-0.5375[a]		0.3190[a]
blo	-0.5354[a]	0.3804[a]	0.2270[a]	
ta	6.16e-07	-3.80e-08	5.04e-06[a]	-5.89e-06[a]
ltdta	-0.5985[a]	-0.002	0.0387[a]	0.0788[a]
xrdta	3.605[a]	-0.030[b]	0.0323[b]	0.0304[c]
xadta	-0.0004	-0.0005	-0.0029	-0.0036
ebita	0.0333	0.1213[a]	0.2652[a]	-0.0762[a]
cape	0.5119[a]	0.0036	-0.0236[a]	0.0145[a]
tat		0.0096[a]	-0.0059[a]	0.0011
cr		-0.0008[a]	-0.0032[a]	7.09e-05
trat		0.0099[a]	0.0369[a]	-0.0107[a]
beta		-6.97e-05	-1.86e-05	-8.68e-05
sdr		-0.0004	-0.0048[a]	-0.0043[a]
R^2	0.1221	0.0730	0.1783	0.0280
Model F-stat	452.65[a]	1382.82[a]	1280.68[a]	617.02[a]
Total N	27475	27475	27475	27475

a: significant at 1%
b: significant at 5%
c: significant at 10%

Panel B: Variables are adjusted by industry and size

Independent variables	Dependent variables			
	aq	ains	aint	ablo
Intercept	0.2021[a]	0.0364[a]	0.0190[a]	-0.0056[a]
Aq		0.0219[a]	0.0205[a]	-0.0175[a]
Ains	0.9660[a]		-0.3999[a]	0.5852[a]
ains^2	0.5400[a]			
ains^3	-0.7127[a]			
Aint	1.217[a]	-0.4992[a]		0.3405[a]
Ablo	-0.5899[a]	0.4219[a]	0.1967[a]	
Ta	-1.62e-06	-1.28e-06[a]	-1.56e-06[a]	-1.00e-06[a]
Altdta	-0.3386[a]	-0.0210[a]	-0.0698[a]	0.0713[a]
Axrdta	2.859[a]	-0.0223	0.0948[a]	0.0301[b]
Axadta	0.0241	-0.0007	-0.0013	-0.0025
Aebita	0.2370[a]	0.0633[a]	0.1120[a]	-0.0384[a]
Acape	0.3742[a]	0.0063[c]	-0.0018	-0.0023
Atat		0.0039[b]	0.0002	0.0004
Acr		-8.86e-05	3.80e-05	-0.0001
Atrat		0.0049[a]	0.0279[a]	-0.0152[a]
Abeta		-0.0001[b]	-4.80e-05	-2.29e-05
Asdr		5.36e-05	-0.0023[a]	-0.0037[a]
R^2	0.0564	0.0253	0.0635	0.0155
Model F-stat	274.71[a]	993.52[a]	671.91[a]	639.17[a]
Total N	27475	27475	27475	27475

a: significant at 1%
b: significant at 5%
c: significant at 10%

4.2 Aggregation of Year-by-Year Regressions

Table 5 reports the average coefficient value from 12 year-by-year first order cross-sectional regressions of firm performance on ownership, the percentage of positive coefficients, and the statistics to test the null hypothesis that the average coefficient is zero (Gibbons and Shanken, 1987; Meulbroek, 1992; and Fama and MacBeth, 1973). Panel A contains the results without industry adjustment, and Panel B contains the results with industry adjustment. The results confirm the patterns reported above, with both insider and institutional ownership variables carrying significant positive coefficients and blockholder ownership variable carrying a significant negative coefficient.

Table 5. Aggregation of Year by Year First Order Regression of Firm Performance on Ownerships

The table shows the average coefficient value from 12 cross-sectional regressions, the percentage of positive coefficients, and the statistics to test the null hypothesis that the average coefficient is zero. We follow Chung (2000) to use the chi-square test outlined in Gibbons and Shanken (1987), and the z-statistic outlined in Meulbroek (1992). We also use the t-statistic presented by Fama and MacBeth (1973). We consider an average coefficient to be significantly different from zero only when at least two test statistics reject the null hypothesis, and the significance level will be the same as the test statistic with the greatest significance level.

Panel A: Variables not adjusted by industry and size.

	Intercept	ins	int	blo	ta	xrdta	xadta	ltdta	Cape	ebita
Average coefficient	0.8512	0.3605	0.2557	-0.5628	3.65[e]-08	3.762	0.482	-0.415	0.898	0.300
Positive coefficients	100%	100%	83%	0%	50%	100%	67%	0%	100%	58%
χ^2-statistic	182.907[a]	98.249[a]	94.855[a]	106.469[a]	45.736[a]	176.684[a]	59.138[a]	92.495[a]	126.807[a]	40.050[b]
z-statistic	27.739[a]	8.478[a]	7.341[a]	-8.560[a]	-0.352	21.463[a]	1.599	-8.094[a]	15.842[a]	2.517[b]
t-statistic	14.934[a]	6.773[a]	3.480[a]	-1.874[c]	0.019	15.125[a]	2.509[b]	-5.517[a]	4.857[a]	1.448
Average R^2	0.1425									

Panel B: Variables are adjusted by industry and size

	Intercept	ains	aint	ablo	ta	axrdta	axadta	altdta	Acape	aebita
Average coefficient	0.220	0.392	0.519	-0.495	-5.17[e]-06	3.485	0.463	-0.279	0.792	0.538
Positive coefficients	100%	100%	100%	0%	8%	100%	83%	8%	100%	83%
χ^2-statistic	182.907[a]	115.216[a]	139.018[a]	84.666[a]	54.353[a]	173.616[a]	36.241[c]	66.597[a]	122.661[a]	49.837[a]
z-statistic	28.212[a]	9.466[a]	11.992[a]	-7.130[a]	-4.968[a]	16.888[a]	3.147[a]	-5.560[a]	13.484[a]	4.809[a]
t-statistic	19.517[a]	9.208[a]	9.575[a]	-1.713	-5.057[a]	10.459[a]	2.751[a]	-5.561[a]	4.410[a]	2.150[c]
Average R^2	0.0982									

a: significant at 1% b: significant at 5% c: significant at 10%

Table 6. Aggregation of Year by Year Second Order Regression of Firm Performance on Ownerships

We follow Chung (2000) to use the chi-square test outlined in Gibbons and Shanken (1987), and the z-statistic outlined in Meulbroek (1992). We also use the t-statistic presented by Fama and MacBeth (1973). We consider an average coefficient to be significantly different from zero only when at least two test statistics reject the null hypothesis, and the significance level will be the same as the test statistic with the greatest significance level.

Panel A: Variables not adjusted by industry and size

	intercept	ins	ins^2	int	blo	ta	xrdta	xadta	ltdta	Cape	ebita
Average coefficient	0.867	0.159	0.295	0.253	-0.563	-4.55 e-07	3.767	0.476	-0.417	0.900	0.302
Positive coefficients	100%	67%	67%	83%	0%	33%	100%	67%	0%	100%	58%
χ^2-statistic	182.907[a]	27.912	18.776	93.199[a]	106.470[a]	46.149[a]	176.875[a]	58.491[a]	93.087[a]	126.766[a]	50.825[a]
z-statistic	27.528[a]	1.440	1.755[c]	7.208[a]	-8.577[a]	-0.748	21.469[a]	1.539	-8.146[a]	15.851[a]	4.881[a]
t-statistic	15.927[a]	1.346	2.406[b]	3.435[a]	-1.871[c]	-0.239	15.184[a]	2.503[b]	-5.565[a]	4.852[a]	1.454
Average R^2	0.1430										

Panel B: Variables are adjusted by industry and size

	intercept	ains	ains^2	aint	ablo	ta	axrdta	axadta	altdta	Acape	aebita
Average coefficient	0.213	0.324	0.254	0.523	-0.495	-4.97 e-06	3.483	0.450	-0.282	0.792	0.539
Positive coefficients	100%	100%	67%	100%	0%	58%	100%	83%	8%	100%	83%
χ^2-statistic	182.907[a]	77.022[a]	21.818	140.606[a]	84.961[a]	51.755[a]	173.616[a]	35.235[b]	67.210[a]	122.501[a]	49.846[a]
z-statistic	25.389[a]	6.588[a]	1.839[c]	12.130[a]	-7.142[a]	-4.795[a]	16.908[a]	3.037[a]	-5.646[a]	13.475[a]	4.835[a]
t-statistic	17.787[a]	6.849[a]	2.514[b]	9.578[a]	-1.712[c]	-4.918[a]	10.467[a]	2.663[b]	-5.613[a]	4.412[a]	2.152[b]
Average R^2	0.0988										

a: significant at 1% b: significant at 5% c: significant at 10%

Table 6 reports the same for the year-by-year second order regressions, with the additional squared insider holding term. Without industry adjustment (Panel A), the squared insider holding term is weakly significant and positive, while the insider holding term becomes insignificant. With industry adjustment (Panel B), the insider holding term is highly significant, while the squared insider holding term is weakly significant. The overall results, however, still broadly agree with earlier patterns.

Table 7. Aggregation of Year by Year Third Order Regression of Firm Performance on Ownerships

We follow Chung (2000) to use the chi-square test outlined in Gibbons and Shanken (1987), and the z-statistic outlined in Meulbroek (1992). We also use the t-statistic presented by Fama and MacBeth (1973). We consider an average coefficient to be significantly different from zero only when at least two test statistics reject the null hypothesis, and the significance level will be the same as the test statistic with the greatest significance level.

Panel A: Variables not adjusted by industry and size

	intercept	ins	ins^2	ins^3	int	blo	ta	xrdta	xadta	ltdta	cape	ebita

Average coefficient	0.877	-0.160	1.437	-0.788	0.259	-0.573	4.18 e-07	3.648	0.597	-0.431	0.867	0.316
Positive coefficients	100%	42%	83%	17%	92%	0%	33%	100%	75%	0%	100%	58%
χ^2-statistic	182.907[a]	18.702	17.666	11.076	92.753[a]	111.698[a]	41.618[b]	170.843[a]	61.088[a]	94.698[a]	114.830[a]	39.101[b]
z-statistic	27.670[a]	-0.566	1.827[c]	-1.114	7.358[a]	-8.958[a]	-0.508	21.102[a]	2.387[b]	-8.323[a]	15.193[a]	2.644[b]
t-statistic	16.920[a]	-0.885	2.990[a]	-2.29[b]	3.652[a]	-1.923[c]	0.175	13.045[a]	3.521[b]	-6.085[a]	4.540[a]	1.543
Average R^2	0.1433											

Panel B: Variables are adjusted by industry and size

	intercept	ains	ains^2	ains^3	aint	ablo	ta	axrdta	axadta	altdta	acape	aebita
Average coefficient	0.211	0.376	0.514	-0.580	0.523	-0.497	-4.77 e-06	3.489	0.444	-0.282	0.791	0.542
Positive coefficients	100%	100%	92%	17%	100%	0%	8%	100%	83%	8%	100%	83%
χ^2-statistic	182.907[a]	75.241[a]	28.421	24.328	140.775[a]	85.230[a]	48.771[a]	173.616[a]	34.896	67.260[a]	122.223[a]	49.622[a]
z-statistic	24.081[a]	6.383[a]	2.910[a]	-2.08[b]	12.150[a]	-7.171[a]	-4.572[a]	16.963[a]	3.002[a]	-5.646[a]	13.475[a]	4.867[a]
t-statistic	17.496[a]	6.405[a]	3.072[a]	-2.07[c]	9.677[a]	-1.709	-4.700[a]	10.486[a]	2.625[b]	-5.577[a]	4.410[a]	2.173[c]
Average R^2	0.0993											

a: significant at 1% b: significant at 5% c: significant at 10%

Table 7 reports the same for the year-by-year third order regressions, with the additional cubed insider holding term. Without industry adjustment (Panel A), the squared insider holding term is weakly significant and positive. The insider holding term becomes negative and insignificant, while the cubed term is negative and only weakly significant for one of the 3 tests. This result does not agree with our earlier patterns. With industry adjustment (Panel B), the insider holding term is highly significant and positive, the squared insider holding term is highly significant and positive for 2 of the 3 tests, and the cubed term is significant and negative for 2 of the 3 tests. Again, the industry-adjusted results confirm our earlier finding of a strong U-shaped relationship between insider holding and firm performance.

Table 8. Aggregation of Year by Year Regressions of Ownership on Firm Performance and Other Control Variables

Variables are not adjusted by industry and size. We follow Chung (2000) to use the chi-square test outlined in Gibbons and Shanken (1987), and the z-statistic outlined in Meulbroek (1992). We also use the t-statistic presented by Fama and MacBeth (1973). We consider an average coefficient to be significantly different from zero only when at least two test statistics reject the null hypothesis, and the significance level will be the same as the test statistic with the greatest significance level.

Panel A: Dependent variable is insider ownership

	intercept	q	int	blo	ta	xrdta	xadta	ltdta	ebita	cape	tat	cr	trat	beta	sdr
Average coefficient	.187	.010	-.294	0.347	-2.55 e-06	-.042	.075	.001	.068	.042	.013	1.56 e-04	-.006	-5.42 e-05	-9.37 e-06
Positive coefficients	100%	100%	0%	100%	0%	25%	83%	50%	100 %	83%	17%	67%	17%	17%	50%
χ^2-statistic	182.9[a]	111.5[a]	182.9[a]	182.9[a]	151.3[a]	38.1[b]	25.8	13.1	113[a]	70.6[a]	95.5[a]	33.1	48.1[a]	22.7	47.4[a]
z-statistic	37.9[a]	9.73[a]	-55.0[a]	40.3[a]	-13.3[a]	-2.84[a]	1.52	.182	8.86[a]	6.72[a]	8.13[a]	-.248	-4.09[a]	-.771	.286
t-statistic	18.9[a]	6.64[a]	-18.9[a]	3.29[a]	-16.0[a]	-1.80[c]	3.51[a]	.233	6.33[a]	3.25[a]	6.18[a]	.395	-3.29[a]	-.584	-.008
Average R^2	0.2115														

Panel B: Dependent variable is institutional ownership

	intercept	q	ins	blo	ta	xrdta	xadta	ltdta	ebita	cape	tat	cr	trat	beta	sdr
Average coefficient	.306	.003	-.313	.060	8.24 e-06	.059	-.011	.022	.285	-.042	-.011	-.003	.053	1.05 e-04	-6.35 e-03
Positive coefficients	100%	67%	0%	67%	100%	75%	33%	58%	100%	8%	0%	0%	100%	67%	0%
χ^2-statistic	182.9[a]	74.1[a]	182.9[a]	120.6[a]	106.8[a]	70.6[a]	38.6[b]	66.6[a]	182.9[a]	79.3[a]	78.2[a]	132.6[a]	176.7[a]	25.7	142.5[a]
z-statistic	64.2[a]	3.30[a]	-53.5[a]	15.6[a]	8.61[a]	4.16[a]	-1.8[c]	3.48[a]	31.8[a]	-7.7[a]	-6.9[a]	-11.9[a]	28.2[a]	.144	-12.9[a]
t-statistic	24.3[a]	1.34	-10.6[a]	1.70[c]	8.27[a]	1.87[c]	-.483	1.41	14.2[a]	-3.2[a]	-7.0[a]	-9.13[a]	9.26[a]	1.07	-6.03[a]
Average R^2	0.280														

Panel C: Dependent variable is blockholder ownership

	intercept	q	ins	int	ta	xrdta	xadta	ltdta	ebita	cape	tat	cr	trat	beta	sdr
Average coefficient	.224	-.007	.335	.094	-7.34 e-06	-2.27 e-04	.079	.077	-.024	.015	.005	-3.3 e-04	-.015	-1.22 e-04	-5.45 e-03
Positive coefficients	100%	0%	100%	67%	0%	50%	83%	100%	42%	58%	100%	42%	8%	50%	8%
χ^2-statistic	182.9[a]	95.6[a]	182.9[a]	132.3[a]	173.0[a]	25.6	42.8[a]	106.8[a]	60.7[a]	61.4[a]	22.8	23.1	131.3[a]	40.9[b]	83.1[a]
z-statistic	42.1[a]	-7.08[a]	41.2[a]	15.9[a]	-13.4[a]	.092	.869	9.01[a]	-3.51[a]	2.36[b]	2.73[a]	-.525	-10.2[a]	-1.35	-6.81[a]
t-statistic	12.0[a]	-7.37[a]	11.4[a]	3.29[a]	-11.1[a]	-.016	4.13[a]	7.08[a]	-1.79[c]	1.28	4.27[a]	-.725	-7.63[a]	-.620	-4.01[a]
Average R^2	0.1358														

a: significant at 1%
b: significant at 5%
c: significant at 10%

Investigating the relationship from the opposite direction, Table 8 shows the results from aggregation of year-by-year regressions of ownership on firm performance and other control variables using the same test statistics. Panel A reports the results for insider ownership, Panel B institutional ownership, and Panel C blockholder ownership.

Keeping our focus on the relationship between ownership and firm performance, we observe that firm performance has a positive and highly significant effect on insider ownership, positive and highly significant effect on institutional ownership, and a negative and highly significant effect on blockholder ownership. This confirms our earlier findings. In term of the relationships between the different types of ownerships, we observe an interesting pattern. Insider and institutional ownership have a negative effect on each other, though a positive effect on blockholder ownership. Blockholder ownership has a positive effect on both insider and institutional ownership. It seems that for a given structure involving large ownership groups, insider and institutional ownerships are substitutes for each other, hence when one increases, the other decreases. On the other hand, as blockholder ownership tends to be negatively associated with firm performance, increased blockholder ownership leads to an increase in either inside ownership or institutional ownership, as compensation, to reach an endogenously determined equilibrium ownership structure.

Table 9. Aggregation of Year by Year Regressions of Ownership on Firm Performance and Other Control Variables

Variables are adjusted by industry and size. We follow Chung (2000) to use the chi-square test outlined in Gibbons and Shanken (1987), and the z-statistic outlined in Meulbroek (1992). We also use the t-statistic presented by Fama and MacBeth (1973). We consider an average coefficient to be significantly different from zero only when at least two test statistics reject the null hypothesis, and the significance level will be the same as the test statistic with the greatest significance level.

Panel A: Dependent variable is industry-size adjusted insider ownership

	intercept	aq	aint	ablo	ta	axrdta	axadta	altdta	aebita	acape	atat	acr	atrat	abeta	asdr
Average coefficient	.040	.012	-.258	.303	-1.45 e-06	-.043	.041	.005	.055	.028	.004	-5.86 e-05	-.011	-4.24 e-06	-7.74 e-04
Positive coefficients	100%	100%	0%	100%	0%	33%	58%	67%	100%	83%	67%	50%	0%	33%	50%
χ^2-statistic	182.9[a]	123.8[a]	182.9[a]	182.9[a]	132.5[a]	37.6[b]	21.9	20.0	88.2[a]	56.4[a]	33.2	28.8	91.8[a]	24.6	52.9[a]
z-statistic	30.7[a]	10.4[a]	-34.1[a]	36.7[a]	-10.4[a]	-2.61[b]	.814	.970	7.20[a]	4.14[a]	2.24[b]	-.589	-7.7[a]	-.517	1.45
t-statistic	43.1[a]	7.58[a]	-15.1[a]	3.74[a]	-11.0[a]	-1.77[c]	1.61	.816	5.61[a]	2.72[a]	2.00[b]	-.158	-6.1[a]	-.056	-.695
Average R^2	0.1365														

Panel B: Dependent variable is industry-size adjusted institutional ownership

	intercept	aq	ains	ablo	ta	axrdta	axadta	altdta	aebita	acape	atat	acr	Atrat	abeta	asdr
Average coefficient	.015	.007	-.192	.110	-8.2 e-07	.144	-.001	-.077	.122	.006	-6.85 e-04	5.22 e-04	.040	-7.98 e-05	-.003
Positive coefficients	25%	100%	0%	83%	17%	100%	50%	0%	100%	48%	25%	67%	100%	48%	0%
χ^2-statistic	159.2[a]	99.2[a]	182.9[a]	135.0[a]	58.0[a]	138.9[a]	30.8	166.0[a]	179.3[a]	69.6[a]	9.23[a]	26.3	174.5[a]	23.2	84.3[a]
z-statistic	13.2[a]	8.13[a]	-35.4[a]	14.5[a]	-4.3[a]	11.7[a]	-1.97[c]	-11.6[a]	20.0[a]	-.803	-.468	.924	22.6[a]	-1.33	-7.10[a]
t-statistic	14.7[a]	6.31[a]	-9.50[a]	2.19[b]	-2.9[a]	9.95[a]	.511	-11.2[a]	9.85[a]	.706	-.967	1.49	10.3[a]	-1.58	-4.43[a]
Average R^2	0.1473														

Panel C: Dependent variable is industry-size adjusted blockholder ownership

	intercept	aq	ains	aint	Ta	axrdta	axadta	altdta	aebita	acape	atat	acr	atrat	abeta	asdr
Average coefficient	.009	-.006	.308	.092	-1.81 e-06	.037	.004	.066	-.021	.001	.001	-3.3 e-05	-.016	-1.52 e-04	-.004
Positive coefficients	83%	0%	100%	83%	0%	67%	58%	100%	17%	50%	75%	33%	0%	33%	17%
χ^2-statistic	84.3[a]	67.1[a]	182.9[a]	135.1[a]	112.3[a]	23.4	28.9	107.9[a]	41.1[b]	58.9[a]	26.1	22.2	132.8[a]	39.5[b]	76.4[a]
z-statistic	5.83[a]	-5.9[a]	37.4[a]	14.8[a]	-8.79[a]	1.56	-1.48	8.36[a]	-2.79[a]	-.254	-.17	-.36	-10.6[a]	-1.6[c]	-5.13[a]
t-statistic	3.12[a]	-5.8[a]	10.9[a]	2.70[b]	-7.70[a]	2.37[b]	.235	5.97[a]	-2.13[b]	.117	.585	-.08	-7.50[a]	-.915	-3.41[a]
Average R^2	0.0967														

a: significant at 1%
b: significant at 5%
c: significant at 10%

Table 9 reports the results from aggregation of year-by-year regressions using the same test statistics with industry adjustment. Panel A reports the results for insider ownership, Panel B for institutional ownership, and Panel C for blockholder ownership. The results in Table 9 confirm the results found in Table 8.

Table 10. Aggregation of Year by Year Third Order Seemingly Unrelated Regression (SUREG)

Variables except book value of total assets are adjusted by industry and size. We follow Chung (2000) to use the chi-square test outlined in Gibbons and Shanken (1987), and the z-statistic outlined in Meulbroek (1992). We also use the t-statistic presented by Fama and MacBeth (1973). We consider an average coefficient to be significantly different from zero only when at least two test statistics reject the null hypothesis, and the significance level will be the same as the test statistic with the greatest significance level.

Panel A: the dependent variable is industry-size adjusted Tobin's q

	intercept	ains	ains^2	ains^3	aint	ablo	ta	axrdta	axadta	altdta	acape	aebita
Average coefficient	0.185	0.879	0.513	-0.574	1.097	-1.134	-4.13 e-06	3.384	0.416	-0.224	0.763	0.542
Positive coefficients	100%	100%	92%	17%	100%	0%	8%	100%	83%	8%	100%	83%
χ^2-statistic	182.91[a]	159.80[a]	33.60	28.42	173.16[a]	157.06[a]	17.46	182.91[a]	38.18[b]	63.86[a]	170.44[a]	92.88[a]
z-statistic	20.76[a]	16.09[a]	3.16[a]	-2.16[b]	25.52[a]	-17.28[a]	-1.83[c]	32.58[a]	3.04[a]	-5.21[a]	21.61[a]	9.49[a]
t-statistic	15.48[a]	8.54[a]	3.10[a]	-2.06[b]	9.661[a]	-1.77[c]	-3.77[a]	10.07[a]	2.54[b]	-4.45[a]	4.41[a]	1.80[c]
Average R^2	0.0872											

Panel B: the dependent variable is industry-size adjusted insider ownership

	intercept	aq	aint	ablo	ta	axrdta	axadta	altdta	aebita	acape	atat	acr	atrat	abeta	asdr
Average coefficient	.034	.024	-.492	.587	-1.01 e-06	-.044	.041	-.026	.081	.019	.003	7.27 e-05	.003	8.80 e-06	-5.60 e-04
Positive coefficients	100%	100%	0%	100%	0%	42%	58%	17%	100%	67%	75%	50%	0%	48%	50%
χ^2-statistic	182.9[a]	179.3[a]	182.9[a]	182.9[a]	39.3[b]	35.4[c]	21.8	36.2[b]	134.0[a]	52.7[a]	27.8	28.8	39.4[b]	17.8	42.4[b]
z-statistic	26.9[a]	23.2[a]	-74.7[a]	86.9[a]	-3.91[a]	-2.27[b]	1.07	-3.3[a]	11.1[a]	3.17[a]	-.061	-.589	2.90[a]	-.866	-.124
t-statistic	23.6[a]	7.74[a]	-15.4[a]	3.45[a]	-7.30[a]	-1.97[b]	1.28	-3.6[a]	7.45[a]	1.84[b]	.200	-.158	1.86[b]	.109	-.534
Average R^2	0.0450														

Panel C: the dependent variable is industry-size adjusted institutional ownership

	intercept	aq	ains	ablo	ta	axrdta	axadta	altdta	aebita	acape	atat	acr	atrat	abeta	asdr
Average coefficient	.018	.018	-.369	.261	-8.6 e-07	.094	-.001	-.074	.120	.005	-1.2 e-04	4.95 e-04	.037	-7.83 e-05	-.003
Positive coefficients	25%	100%	0%	83%	17%	92%	50%	0%	100%	48%	25%	67%	100%	48%	8%
χ^2-statistic	174.8[a]	164.7[a]	182.9[a]	163.3[a]	51.8[a]	87.3[a]	16.8	158.3[a]	182.9[a]	48.8[a]	11.6	27.2	182.9[a]	12.2	48.8[a]
z-statistic	16.5[a]	22.0[a]	-74.7[a]	37.5[a]	-4.3[a]	7.06[a]	-.292	-12.2[a]	20.3[a]	.086	-.08	1.26	31.4[a]	-.871	-4.72[a]
t-statistic	15.6[a]	7.96[a]	-9.21[a]	2.30[b]	-3.3[a]	5.97[a]	-.107	-10.9[a]	9.84[a]	.518	-.13	1.43	10.1[a]	-1.9[b]	-4.08[a]
Average R^2	0.0944														

Panel D: the dependent variable is industry-size adjusted blockholder ownership

	intercept	aq	ains	aint	ta	axrdta	axadta	altdta	aebita	acape	atat	acr	atrat	abeta	asdr
Average coefficient	-.002	-.017	.579	.240	-1.19 e-06	.062	-.004	.063	-.042	-.003	4.74 e-04	2.13 e-05	-.014	-1.47 e-04	-.003
Positive coefficients	50%	0%	100%	83%	8%	75%	42%	92%	8%	50%	67%	25%	8%	33%	25%
χ^2-statistic	67.8[a]	154.3[a]	182.9[a]	163.3[a]	28.2	30.3	16.4	110.4[a]	71.3[a]	57.3[a]	10.9	20.7	122.9[a]	29.4	69.1[a]
z-statistic	-1.28	-16.0[a]	81.5[a]	37.5[a]	-3.2[a]	2.20[b]	-.046	8.43[a]	-6.67[a]	-.964	.456	-.14	-10.2[a]	-1.41	-5.73[a]
t-statistic	-.470	-6.95[a]	11.2[a]	3.60[a]	-4.8[a]	3.18[a]	-.199	5.67[a]	-3.93[a]	-.287	.440	-.06	-5.62[a]	-.905	-2.69[b]
Average R^2	0.0317														

a: significant at 1%
b: significant at 5%
c: significant at 10%

Table 10 reports the results from aggregation of year-by-year third order regressions (containing the squared and cubed insider holding terms) using SUREG with industry adjustment. The squared insider holding term has a significant positive coefficient, and the cubed insider holding term is significantly negative for 2 of the 3 tests. Results on the ownership structure and firm performance variables are similar to earlier results.

4.3 Seemingly Unrelated Regression Results for Pooling Data and Residual Ownership

Table 11 reports the results from SUREG on pooled data with residual ownership as estimated by equations (7) through (9). Panel A contains results without industry adjustment, and Panel B contains results with industry adjustment. The relationships between firm performance and various ownerships remain the same as before. Interestingly, the different results produced by industry adjustment have disappeared. It seems that using residual ownership eliminates or reduces spurious correlations that are captured in earlier tests, as the negative relationship between firm performance and insider holding only occurs for results without industry adjustment. The industry adjustment procedure appears to generate more reliable estimates and test results.

Table 11. Seemingly Unrelated Regressions on the Pooling Data

The residual ownerships are used. The residual insider ownership, reins, is the residual of regression (1) $ins_{it} = \alpha_0 + \alpha_1 int_{it} + \alpha_2 blo_{it} + \varepsilon_{it.}$ reins^2 is the square of reins.The residual institutional ownership, reint, is the residual of regression (2) $int_{it} = \beta_0 + \beta_1 ins_{it} + \beta_2 blo_{it} + \mu_{it.}$ The residual blockholder ownership, reblo, is the residual of regression (3) $blo_{it} = \delta_0 + \delta_1 ins_{it} + \delta_2 int_{it} + \nu_{it}$. Other variables are described in table 1.

Panel a: Variables are not adjusted by industry and size

Independent variables	Dependent variables			
	q	reins	reint	reblo
intercept	1.1070[a]	-0.4385[a]	-0.0604[a]	0.0085[c]
q		0.0185[a]	0.0183[a]	-0.0141[a]
reins	0.4389[a]			
reins^2	1.1740[a]			
reins^3	-1.9346[a]			
reint	0.7964[a]			
reblo	-0.3544[a]			
ta	9.86e-07	-3.31e-06[a]	5.56e-06[a]	-6.20e-06[a]
ltdta	-0.6032[a]	0.0026	0.0529[a]	0.0914[a]
xrdta	3.624[a]	-0.0568[b]	0.0447[a]	0.0377[b]
xadta	-0.0001	-0.0004	-0.0036	-0.0046
ebita	0.0506	0.0486[a]	0.2718[a]	-0.0229[a]
cape	0.5116[a]	0.0157[a]	-0.0288[a]	0.0164[a]
tat		0.0156[a]	-0.0098[a]	0.0035[c]
cr		0.0001	-0.0032[a]	-0.0005
trat		-0.0028[a]	0.0036[a]	-0.0054[a]
beta		-1.09e-04[b]	-7.21e-06	-1.22e-04[c]
sdr		-0.0002	-0.0059[a]	-0.0055[a]
R^2	0.1266	0.0175	0.1475	0.0201
Model F-stat	434.44[a]	71.45[a]	444.82[a]	62.37[a]
Total N	27475	27475	27475	27475

a: significant at 1%
b: significant at 5%
c: significant at 10%

Panel B: Variables are adjusted by industry and size

Independent variables	Dependent variables			
	aq	areins	areint	areblo
intercept	0.2358[a]	0.0212[a]	-0.0021[c]	0.0182[a]
aq		0.0194[a]	0.0204[a]	-0.0132[a]
areins	0.4745[a]			
areins^2	0.7556[a]			
areins^3	-1.624[a]			
areint	1.002[a]			
areblo	-0.3511[a]			
ta	-1.99e-06	-1.39e-06[a]	-1.46e-06[a]	-1.78e-06[a]
altdta	-0.3443[a]	0.0105	-0.0641[a]	0.0644[a]
axrdta	2.878[a]	-0.0455[a]	0.0960[a]	0.0493[a]
axadta	0.0242	-0.0015	-0.0014	-0.0038
aebita	0.2498[a]	0.0399[a]	0.1127[a]	-0.0079
acape	0.3766[a]	0.0070[b]	-0.0019	0.0003
atat		0.0052[a]	-2.74e-05	0.0023
acr		-5.0e-05	-6.26e-05	-0.0002
atrat		-0.0052[a]	0.0262[a]	-0.0120[a]
abeta		-0.0001[b]	-4.16e-05	-6.21e-05
asdr		-0.0002	-0.0030[a]	-0.0047[a]
R^2	0.0615	0.0060	0.0568	0.0105
Model F-stat	250.01[a]	49.52[a]	200.20[a]	39.50[a]
Total N	27475	27475	27475	27475

a: significant at 1%
b: significant at 5%
c: significant at 10%

5. Summary and Conclusions

It is clear from the exhaustive analyses discussed above that our results are robust to different methodologies and potential interpretative issues that might arise from unobserved underlying variables, correlated variables, and other statistical conerns . We utilized OLS pooled regressions, fixed-effect panel-data regressions, aggregation of year-by-year cross-sectional regressions, SUREG, and panel-data regressions. We also used residual ownership to correct for potential overlap in various ownership types. In addition, we applied industry-size adjustment and test our hypotheses both with and without such adjustment. The results from all the methodologies are similar with only minor differences.

In general, we find that firm performance, as measured by Tobin's q (with or without industry adjustment), positively affects both insider and institutional ownership, but negatively affects blockholder ownership. Examining the relationship from the opposite direction, both insider and institutional ownership are associated with higher firm performance, while blockholder ownership is negatively associated with firm performance.

Looking at these three ownership groups, we find that insider and institutional ownership are negatively related to each other, and thus function as substitutes. On the other hand, they are both positively related to blockholder ownership, indicating that the endogenous optimal ownership requires higher insider or institutional ownership when there is high blockholder ownership. As higher blockholder ownership tends to be associated with lower firm performance, it is logical that more monitoring is required from insider or institutional shareholders.

As a methodological note, we find that using residual ownership reduces or eliminates spurious variations in the non-linear relationship between firm performance and insider ownership. In the same estimation for the non-linear relationship, we also find evidence that industry adjustment generates more reliable estimates.

We note that, even after controlling for the endogeneity of insider ownership, we still find positive effects from insider ownership on firm performance, which conflicts with results found by other studies which controlled for endogeneity.

While we do find non-linearity in the relationship between insider ownership and firm performance, our results do not support a relationship as neat as the inverse U-shape effect predicted by Stulz (1988) and supported by many previous studies. Short and Keasey (1999) documented positive effects on firm performance of managerial shareholdings and the cubed of managerial shareholdings, and a negative effect of the square of managerial ownership based on U.K. data. Our results are inconsistent with this and indicate that the effects of insider ownership and its square on performance are positive, though the effect of the cubed of insider ownership on firm performance is negative.

We find strong negative effects of blockholder ownership on firm performance, as discussed by Shleifer and Vishny (1997), and our results indicate that institutional investors are efficient monitors and their existence increases firm value and protects minority shareholders.

The strong negative effect of blockholder ownership on firm performance needs more attention, since the market often expects blockholders to be efficient monitors, enhancing firm value. Shleifer and Vishny (1986), Gorton and Kahl (1999) suggest that blockholders play positive roles in corporate governance, and previous studies document positive roles of blockholders in corporate governance (Shome and Sinch, 1995; Shivdasani, 1993; and Shleifer and Vishny, 1997). In some cases blockholders have insignifcant roles (McConnell and Servaes, 1990; and Loderer and Martin, 1997). However, Shleifer and Vishny (1997) acknowledge that "large investors represent their own interests, which need not coincide with the interests of other investors in the firm, or with the interests of employees and managers." Therefore, "large investors might try to treat themselves preferentially at the expense of other investors and employees…They can do so by paying themselves special dividends or by exploiting other business relationships with the companies they control."[18] As a result, firm value or performance will be hurt.

Burkart and Panunzi (2001) argue the presence of a single blockholder can both protect and hurt minority shareholders. In cases when there are several blockholders, Gomes (2000) shows that the bargaining problems led by the presence of multiple controlling shareholders protect minority shareholders; however, the same bargaining problems prevent efficient decisions.

To summarize, blockholders can positively or negatively affect a firm's performance; we cannot predict which role will dominate in a cross-sectional analysis. Our finding that the role of blockholders is predominantly negative role is consistent with the hypothesis that blockholders represent their own interests, and treat themselves preferentially at the expenses of others. Recent financial news reporting, for example the ongoing drama in Yahoo, also are related to incidences of such self-interest driven activities by so-called corporate raiders.

As our results are robust to different methodologies, this paper contributes new evidence

[18] Dann and DeAngelo (1983) indicate that greenmail and targeted share repurchases are examples of special deals for large investors.

in our understanding of the relationship between firm performance and different types of ownerships, and in particular in the complex interplay between various large investor groups.

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