# Institutional Ownership and Firm Performance: Evidence from Finland[¥]

Prasad S. Bhattacharya[+] and Michael Graham[♣]

**Abstract**

This paper investigates the relationship between different classes of institutional investors and firm performance. Using industry level data from Finland, which is characterized by various institutional investors who own multiple ownership stakes in different firms across a broad spectrum of industries, the paper exhibits two novelties. First, unlike previous studies which treated institutional investors as a monolithic group, we segment them in classes. Second, we recognize the joint determination of firm performance and institutional ownership. We account for this issue in the context of a system of equations, using three stage least squares methodology. The empirical results suggest a significant two-way feedback between firm performance and institutional equity ownership. However, this effect is not symmetric. We find that institutional investors with likely investment and business ties with firms have adverse (negative) effect on firm performance and the impact is very significant in comparison to the negative effect of firm performance on institutional ownership.

*JEL classification:* G32; L20
*Keywords:* Institutional ownership; Firm performance; Joint determination; Three stage least squares technique; System of equations; Two-way feedback.

[¥] We would like to thank Mehmet Ulubasoglu and Gerry Gannon for interesting discussions regarding some of the econometric issues used in this paper. Remaining errors are our responsibility.

[+] *Corresponding author*. Address for correspondence: School of Accounting, Economics and Finance; Faculty of Business and Law; Deakin University; Melbourne Campus at Burwood; 221, Burwood Highway, Burwood, Victoria 3125, Australia. E-mail: prasbhat@deakin.edu.au; Phone #: (+613)9244 6645; Fax #: (+613)9244 6283.

[♣] School of Accounting, Economics and Finance; Faculty of Business and Law; Deakin University; Melbourne Campus at Burwood; 221, Burwood Highway, Burwood, Victoria 3125, Australia. E-mail: michael.graham@deakin.edu.au; Phone #: (+613)9251 7288; Fax #: (+613)9244 6283.

# 1. Introduction

This paper investigates the relationship between institutional ownership and firm performance in Finland. Prior studies examining this relationship in different countries (mainly OECD countries) have produced mixed results. Chaganti and Damanpour (1991) and Lowenstein (1991), for instance, find little evidence that institutional ownership is correlated with firm performance. McConnell and Servaes (1990), on the other hand, report that there is a positive relation between firm value and ownership by institutional investors. Seifert, Gonenc and Wright (2005) study does not find a consistent relationship across countries. They conclude that their inconsistent results may reflect the fact that the influence of institutional investors on firm performance is location specific.[1] The above studies generally consider institutional investors as a monolithic group. However, Shleifer and Vishny's (1986) as well as Pound's (1988) theorizations and later empirical examinations by McConnell and Servaes (1990) suggest that shareholders are differentiable and pursue different agendas. Jensen and Merkling (1976) also show that equity ownerships by different groups have different effects on the firm performance. Therefore, it is important to explore the effect of segmented institutional investors on firm value.

Pound (1988) explores the influence of institutional ownerships on firm performance and proposes three hypotheses on the relation between institutional shareholders and firm performance: *efficient-monitoring* hypothesis, *conflict-of-interest* hypothesis, and *strategic-alignment* hypothesis. The *efficient-monitoring* hypothesis says that institutional investors have greater expertise and can monitor management at lower cost than can small atomistic shareholders. Consequently, this argument predicts a positive relationship between institutional shareholding and firm performance. This proposition implicitly assumes only an investment relationship between institutional shareholding and the firm. The *conflict-of-interest* proposition suggests that in view of

[1] Other studies, e.g., Barclay and Holderness (1990) and Mikkelson and Ruback (1985, 1991) find that institutions can force value maximization in firms. Baysinger and Butler (1985), Jarrell and Lehn (1985) and Hansen and Hill (1991) also find that the level of institutional ownership is associated with increases in research and development expenditures by managers.

other profitable business relationships with the firm, institutional investors are coerced into voting their shares with management. For instance, an insurance company may hold a significant portion of a firm's stock and concurrently act as its primary insurer. Voting against management may significantly affect the firm's business relationship with the incumbent management (and perhaps others as well), whereas voting with the management results in no obvious penalty. The *strategic-alignment* hypothesis states that institutional owners and managers find it mutually advantageous to cooperate. Generally, cooperation reduces the beneficial effects on the firm value that could result from monitoring by large shareholders. Consequently, the *conflict-of-interest* hypothesis and the *strategic-alignment* hypothesis both predict a negative relation between institutional ownership and the value of the firm. Heard and Sherman (1987) also argue that the dual activities of investment and business relationships could create a conflict of interest for these institutions. That is, for these institutions, the power gained from their ownership stake may be tampered somewhat by their reliance on the firm for business activity.

Firm performance may, however, also affect ownership stakes. This leads to a two-way causality or endogeneity problem, where, ownership affects performance and *vice versa*. This is especially interesting within the context of Finland where equity ownership is concentrated and rests with multiple institutional investors. Earlier studies like Demsetz (1983), Demsetz and Lehn (1985), Loderer and Martin (1997), Hermalin and Weisbach (1988), Cho (1998) and Demsetz and Villalonga (2001) consider the possible endogeneity concern between ownership structure and firm performance and address the endogeneity issue using the two-stage least squares (2SLS) framework. Demsetz and Villalonga (2001), however, point out that stronger evidence is needed to explore the endogeneity problem, particularly in the context of concentrated or diffused ownership structure.

This study, therefore, provides additional evidence on the interaction between institutional ownership and firm performance using disaggregated institutional ownership dataset from Finland. We use an advanced empirical technique that provides a more robust way of exploring the endogeneity issue on the relationship between firm

performance and institutional ownership. In doing so, this paper contributes to the empirical literature on ownership and performance in three main ways.

First, distinct from previous studies, this paper employs the three-stage least squares (3SLS) estimation technique to investigate endogeneity between performance and ownership issue.[2] Demsetz and Villalonga (2001), as mentioned above, call for stronger evidence to explore the endogeneity issue. We suggest that the 3SLS would provide more robust evidence because, among other things, it captures cross-equation effects as error terms of individual equations in a system are assumed to be contemporaneously correlated. Also, the 3SLS estimation technique is more suitable for cross-sectional studies, where some of the institutional owners own multiple equity stakes in different firms across industries. As a result, ownership and performance issues can affect each other in various ways. These interactions can be captured well through 3SLS estimation technique.

The second contribution of this study relates to the investigation of different dimensions of institutional ownership and their effect on firm performance. As noted above, prior studies have mostly considered institutional investors as a monolithic group. Using Pound's (1988) hypotheses as a basis, Brickley, Lease, and Smith (1988) and Kochhar and David (1996), classify institutional ownership in two groups, *pressure-resistant* and *pressure-sensitive* institutional investors. *Pressure-resistant* institutional investors are institutional investors that only have an investment relationships with firms in which they own equity. These include pension funds, mutual funds, endowments and foundations. On the other hand, *pressure-sensitive* institutional investors are likely to have both an investment and business relationships with firms in which they own an equity stake. These institutional shareholdings include equity holdings by insurance companies, banks, and non-bank trusts. Following this classification, we examine the effect of *pressure-resistant* and *pressure-sensitive* institutional ownership on firm performance. Based on Pound's (1988) conjectures, it is likely that there would be a negative relationship between *pressure-sensitive* institutional investors and firm performance because of the likely business relationship this class of institutional

[2] Cho (1998) also employs 3SLS apart from 2SLS technique in his study. However, he only reports 2SLS estimation results as his findings from 3SLS remain qualitatively the same.

investors have with firms in which they hold equity. The opposite should hold true for *pressure-resistant* institutional ownership.

Thirdly, this paper explores institutional ownership and firm performance for different industries. It has been argued in the literature (see, for instance, Gilson and Roe (1993) and Roe (1994)) that factors that affect firm performance, ranging from the nature of the board's role to the risk of bankruptcy, vary, among other things, by industry and country. Therefore, different industry and country studies provide further insights on relationship between ownership and firm performance.

This study reports some very important findings. Considering all institutional investors where institutional owners control multiple equity stakes in different firms, the empirical results suggest a significant two-way feedback between firm performance and institutional equity ownership. The magnitudes of this two-way effect, however, differ in the sense that institutional ownership is more sensitive to the firm performance than the other way around. The empirical investigations also suggest that, as proposed by Pound (1988), *pressure-sensitive* institutional ownership stakes adversely affects firm performance and the impact is very significant in comparison to the negative effect of firm performance on institutional ownership**.** These findings remain robust when we estimate, separately, the equations in presence all individual industry-specific dummy variables as well as in presence of different institutional ownership-specific dummies.

The rest of the paper is organized in the following way. In section two, we describe the data and descriptive statistics. Section three outlines the methodology. Section four contains results discussion. Section five concludes. All tables are provided in appendix 1. Appendix 2 summarizes data details.

## 2. Data and descriptive statistics

In this study, firms are selected from publicly traded companies in Finland provided they satisfy two basic data requirements. First, for a firm to be included in the dataset, it is required that ownership data be available for the sample year, 2004. The ownership data used in this paper is collected from the respective firms' 2004 annual

reports. A further requirement is that firms included in the dataset must be included in the Thomson Financial Database. All performance related data is assessed from Thomson Financial Database.[3] The final sample consists of 116 firms.

The overall sample includes 754 institutional ownership observations for the 116 firms. Of these, 419 and 335 observations are deemed as *pressure-sensitive* and *pressure-resistant* institutional shareholdings, respectively. Following Demsetz and Villalonga's (2001), firm performance is measured by Tobin's Q (denoted by *Tobin's Q*), which is defined as the sum of the year-end market value of common stocks and the book value of total debt divided by the book value of total assets.

The firms in the dataset, among others, are partially owned by multiple institutional investors. We, therefore, calculate the Herfindahl index of equity ownership by institutional shareholders (denoted by *Share*[4]) to help identify ownership concentration. The Herfindahl index is calculated as:

$$Share_j = \sum_{i=1}^{I} share_{ij} \qquad (1)$$

where, $share_{ij}$ is the share of institutional owner $i$ in firm $j$. Large values of this index signify that the ownership is concentrated within a few large institutional owners and small values imply that many institutional owners share the ownership stake. The number of observations drops to 180 from initial 754 after calculating the Herfindahl index. It is interesting to note that even though there are 116 firms in the sample used here in this paper, we end up with 180 observations because of multiple ownerships and cross-ownerships across industrial firms. We take care of possible estimation issues in this set-up in our econometric methodology presented in the next section. We also separate the institutional ownership into two categories based on the nature of ownership: (I) shares owned by *pressure-resistant* owners (denoted by "*_pr*") and (II) shares owned by

[3] See Appendix 2 for detailed data related description.

[4] For clarity and ease of presentation, we drop the subscript $j$ from $Share_j$ in the rest of the paper.

*pressure-sensitive* owners (denoted by "*_ps*"). Pressure resistant institutional owners include asset management entities (like pension funds) that only have an investment relationship with the firm. On the other hand, pressure sensitive institutional investors include insurance companies and banks. Pound's (1988) hypothesis suggests that these firms are likely to have both an investment and business relationship with the firm in which they own equity stakes.

To address endogeneity or two way causality problem between performance and ownership, we use return on equity (denoted by *ROE*) as an alternative measure of performance. *ROE* is used as an instrument for firm performance in the empirical estimation later. Herfindahl index of ownership based on owners voting rights (proportion of decisive votes with the stakeholders), denoted by *Vote* in appendix tables, is used as an alternative measure of ownership. *Vote* is used as a plausible instrument for *Share*. Sales growth (denoted by *Salesg*) is used as an additional explanatory variable.[5] Higher sales growth may have a positive effect on the value of the firm, attracting additional ownership stakes. In regressing performance on ownership, cash flow (divided by total assets and denoted by *Cashf*) is added as another explanatory variable. Cash flow deflated by total assets is used as a proxy for liquidity[6].

In accordance with the existing literature, we investigate the firm performance and ownership feedbacks on each other using *four* control variables:

(1) *Leverage* (denoted by *Levg*): Stultz (1988) theorizes that high (insider) ownership may increase leverage. This happens because owners with substantial controls may increase debt as a proportion of equity to maintain their ownership stakes. On the other hand, pecking order theory suggests a negative relationship between various measures of firm performance and leverage. To reconcile the two contradicting views, we use this control variable, which is measured as the ratio of total debts to assets (debt-to-

[5] In Himmelberg, Hubbard and Palia (1999), they employ logarithm of sales as a control for firm characteristic and not as an explanatory variable.

[6] Following Seifert et al. (2005), we use 3-year averages for the control and explanatory variables to reduce the noise associated with figures based on just a year of data.

equity ratio). Anderson and Reeb (2003) also control for debt in the capital structure in this way.

(2) *Capital expenditure* (denoted by *Kexp*): Capital expenditures (scaled by total assets) can proxy for investment and may positively affect firm performance (see, Jensen (1986, 1989)). This variable is included as a control variable to take into account the possible influence of investment on ownership, as mentioned in Short (1994). Thomsen, Pedersen and Kvist (2006), in a recent study, also throw light on this control variable.

(3) *Market risk* (denoted by *Mktrisk*): This is measured by the standard deviation of monthly stock returns over the prior sixty months. Demsetz and Lehn (1985), using cross-sectional data for US, show that the level of (managerial) ownership is determined by the riskiness of the firm, measured by the volatility of the stock price. It is based on "moral hazard" type argument, which says that managers of riskier firms are more prone to face moral hazards. As a result, their ownership stakes would be greater to abet fluctuations in incentives. Whether the same kind of argument holds true for institutional ownership remains an interesting question, which is addressed in this paper as well. Andersen and Reeb (2003) also use the same control variable in their analysis.

(4) *Firm size* (denoted by *Ln*(*Size)*, after taking logarithm for scale adjustment): It has often been argued that size should be negatively related to ownership (see, for instance, Demsetz and Lehn (1985)) since it is harder to own the same percentage in a large firm as compared to a small firm. We measure firm size by book value of total assets. In their study, Anderson and Reeb (2003) also utilize the same measure for firm size.

Additionally, the following nine industry-level dummies are also used for checking the industry-specific performance and ownership interactions: (1) information technology industry dummy (denoted by *Ites*), (2) industrials dummy (denoted by *Inds*), (3) consumer discretionary industry dummy (denoted by *Cond*), (4) consumer staples industry dummy (denoted by *Stap*), (5) materials industry dummy (denoted by *Mate*), (6) healthcare industry dummy (denoted by *Heal*), (7) real estate industry dummy (denoted by *Rest*), (8) telecommunication industry dummy (denoted by *Tele*) and (9) utilities industry dummy (denoted by *Util)*. Demsetz and Villalonga (2001), Demsetz and Lehn

(1985) and Cho (1998) also employ industry-specific dummies (utility industry, media industry and financial industry) in their studies.

In Tables 1, 2 and 3 of appendix 1, we present the descriptive statistics of the dependent and independent variables (performance (*Tobin's Q*) and ownership (*Share*)), their instruments (*ROE* and *Vote*), control variables (*Levg*, *Kexp*, *Mktrisk*, and *Size*) and exogenous variables (*Cashf* and *Salesg*) for all types of institutional owners. From these three tables, performance measured by *Tobin's Q* and the alternative measure of performance, return on equity (*ROE*), show consistent results in terms of their sample moment statistics. The average value of firm performance for all institutional owners (1.154) is in line with the existing studies. For instance, Cho reports Tobin's q of 1.100 in 1990 for 326 Fortune 500 firms; Demsetz and Villalonga finds Tobin's q to be 1.129 for 223 US firms and Seifert *et al.* tabulate Tobin's q of 1.286 for 319 German firms. It is interesting to note that, Herfindahl indexes for institutional ownership (*Share*) and voting rights (*Vote*) show that ownership is diffused across multiple firms for all types of institutional owners. In comparison to that, firm ownership seems to be concentrated for pressure sensitive institutional owners.

Table 4 reports correlation results for all variables. *Share* and *Vote* show high correlation, which is expected between the original variable (in the case, *Share*) and the instrumental variable (in this case, *Vote*). Similarly, *Tobin's Q* and *ROE* exhibit moderately high correlation. Negative correlations between two exogenous variables (*Cashf* and *Salesg*) and ownership stakes (*Share*) suggest that cash flow and sales growth may affect ownership in an adverse way. We find some support for our earlier conjecture regarding sales growth and firm performance (refer to the positive correlation between *Salesg* and *Tobin's Q*), i.e., higher sales growth may have a positive effect on the value of the firm. Looking at the correlations between controls (*Levg*, *Kexp*, *Mktrisk* and *Size*) and firm performance (*Tobin's Q*), we find a priori support for the pecking order theory, as *Tobin's Q* and *Levg* are negatively correlated. Correlation results between ownership (*Share*) and the above controls show some support for market risk (*Mktrisk*) and ownership (*Share*) argument (positive) provided earlier.

## 3. Methodology

In the setup adopted in this paper, there is a potential two-way causality or endogenous relationship between institutional ownership and firm performance. As pointed out by Demsetz and Villalonga (2001) and Cho (1998), a simple OLS estimation to investigate the relationship between the two variables would yield biased and inconsistent estimators. As such, a more sophisticated estimation technique is needed. Two ways, among others, to address the problem of biased and inconsistent estimators include the use of instrumental variable two stage least squares (2SLS) technique or to employ instrumental variable three stage least squares (3SLS) technique. The main difference between 2SLS and 3SLS estimation technique is that 3SLS captures cross-equation effects as error terms of individual equations in the system are assumed to be contemporaneously correlated under 3SLS.

We propose that the 3SLS technique is more suitable for our cross-section dataset, as some of the institutional owners own multiple equity stakes in different firms. As a result, ownership and performance issues can affect each other in various ways. These interactions can be captured through 3SLS estimation technique. Under 3SLS setup, choice of instruments plays a very important role. Therefore, as in Bennedsen, Nielsen, Perez-Gonzalez and Wolfenzon (2006), we make careful considerations on the choice of instruments when we estimate the performance and ownership relationships in the following way:

$$Tobin'sQ = \alpha_0 + \alpha_1.Share + \alpha_2.Levg + \alpha_3.K\exp + \alpha_4.Mktrisk + \alpha_5.Ln(Size) + \alpha_6.Cashf + \varepsilon_1 \quad (2)$$

$$Share = \beta_0 + \beta_1.Tobin'sQ + \beta_2.Levg + \beta_3.K\exp + \beta_4.Mktrisk + \beta_5.Ln(Size) + \beta_6.Salesg + \varepsilon_2 \quad (3)$$

where, *Tobin's Q* and *Share* are two dependent variables in this system of equations, showing possible two-way relationship as *Share* and *Tobin's Q* also show up on the right

hand sides of individual regression equations. $\varepsilon_1$ and $\varepsilon_2$ are error terms for individual equations (2) and (3), which are assumed to be contemporaneously correlated.[7] We take the return on equity (denoted by *ROE*) as a plausible instrument for firm performance measured by Tobin's Q (denoted by *Tobin's Q*). For ownership, we employ the Herfindahl index of proportion of decisive vote shares (denoted by *Vote*) controlled by institutional owners as an instrument for institutional owners equity stakes. Leverage (*Levg*), capital expenditure (*Kexp*), market risk (*Mktrisk*) and logarithm of firm size (*Ln(Size)*) are control variables in both equations. *Cashf* is the unique exogenous variable in equation (2) and *Salesg* is the unique exogenous variable in equation (3). This uniqueness is helpful to correctly identify the system (comprising of the above two equations, (2) and (3)) before estimation. [8]

To cross-check the validity of instruments chosen, first, we perform Hausman's (1978) test for endogeneity by regressing and reporting the coefficient of the residuals in the second stage regression. These residuals are generated from the first stage regression when the endogenous variable is regressed on all possible instruments and exogenous variables. In all of the cases involving industry-specific dummies and without industry-specific dummies, we find that Hausman test points to possible endogenous relationships with the chosen instruments working as correct proxies (see the first column in Table 5 of Appendix 1 for reference). Thereafter, we test whether the instruments are statistically relevant. Following the suggestion of Staiger and Stock (1997) as well as Hahn and Hausman (2002), we use the joint significance of *F-test* statistics when the endogenous variable is regressed on instrument and all other exogenous variables to measure relevance of those particular instruments. We report this as 'Relevance' in the second column of Table 5. In the third column of Table 5, we report one of the necessary conditions for choice of instruments, i.e., the correct instruments should be highly conditionally correlated with endogenous variables. We find that *Vote* is very highly

[7] 3SLS is appropriate if right-hand side variables are correlated with the error terms, and there is both heteroskedasticity, and contemporaneous correlation in the residuals. We have checked for the presence of heteroskedasticity using White's (1980) heteroskedasticity test and contemporaneous correlation in the residuals using Breusch-Godfrey test before applying 3SLS technique.

[8] System identification entails checking and satisfying both the rank and order conditions (see, Hsiao (1983)). We have checked those and find that the system is correctly identified.

correlated with *Share*. Similarly, *ROE* is also positively correlated with performance variable. Finally, we perform Sargan's (1958) test for overidentifying restrictions in the instrumental variable estimation.[9] A check of the last column of Table 5, where we present these test results denoted by 'Overidentification' reveals one interesting fact. *ROE* and interactive terms of *ROE* as instruments met with the overidentification criteria. However, *Vote* and interactive terms of *Vote* show that all instruments are not orthogonal to the error. Therefore, we employ different sets of instruments involving *Vote* and interactive terms of *Vote*.

The estimation results of these two equations are reported as M1 in the first two columns of Table 6 for all types of institutional owners. Additionally, we checked the robustness of estimated interaction between *Tobin's Q* and *Share* in presence of industry-specific dummies in the above two equations. The results of these 3SLS estimation are reported as M2 (includes utility industry dummy as in Demsetz and Lehn (1985) and Demsetz and Villalonga (2001)) and M3 (excluding utility industry dummy) in the last four columns of Table 6 for all types of institutional owners.

Thereafter, we explore the robustness of institutional ownership-specific effects on the firm performance by estimating the following system of equations with ownership-specific interactive dummies in the following way:

$$\begin{aligned} Tobin'sQ = {} & \gamma_0 + \gamma_1.Share + \gamma_2.Share * dum\_pi + \gamma_3.Levg + \gamma_4.Levg * dum\_pi \\ & + \gamma_5.K\exp + \gamma_6.K\exp * dum\_pi + \gamma_7.Mktrisk + \gamma_8.Mktrisk * dum\_pi \\ & + \gamma_9.Ln(Size) + \gamma_{10}.Ln(Size) * dum\_pi + \gamma_{11}.Cashf + \gamma_{12}.Cashf * dum\_pi + \varepsilon_3 \end{aligned} \quad (4)$$

$$\begin{aligned} Share = {} & \delta_0 + \delta_1.Tobin'sQ + \delta_2.Tobin'sQ * dum\_pi + \delta_3.Levg + \delta_4.Levg * dum\_pi \\ & + \delta_5.K\exp + \delta_6.K\exp * dum\_pi + \delta_7.Mktrisk + \delta_8.Mktrisk * dum\_pi \\ & + \delta_9.Ln(Size) + \delta_{10}.Ln(Size) * dum\_pi + \delta_{11}.Salesg + \delta_{12}.Salesg * dum\_pi + \varepsilon_4 \end{aligned} \quad (5)$$

[9] Sargan's test statistic is a special case of Hansen's (1982) $J$ statistic, and it is distributed as a $\chi^2_{L-K}$ under the null hypothesis that all instruments are orthogonal to the error term. $L$ denotes numbers of instruments and $K$ denotes the numbers of parameters. Without dummies, we have 21 degrees of freedom for the $\chi^2_{L-K}$ test statistic, which shows a critical value of 30.014 under 5% significance level. Note that we want to accept the null hypothesis in this case to obtain the desired result.

where, $i = r$ or s , depending on whether it is a *pressure-resistant* institutional owner (representation will be *dum_pr*) or a *pressure-sensitive* institutional owner (representation will be *dum_ps*). Analogous to the above system, *Tobin's Q* and *Share* are two dependent variables in this system of equations, showing possible two-way relationship as *Share* and *Tobin's Q* also show up on the right hand sides of individual regression equations. The $\varepsilon_i$'s are error terms for individual equations (4) and (5), which are assumed to be contemporaneously correlated. Non-interactive terms in equations (4) and (5) will show the effect of the other institutional ownership. For example, when we run the above system for *pressure-resistant* type institutional owners, then non-interactive terms will report the effect for *pressure-sensitive* type owners in the data sample. The results of these estimations are reported under M1 in the first two columns of Table 7 in the first Appendix.[10] We also estimate the above equation in presence of industry-specific dummies interacted with ownership-specific dummies to explore the robustness of the reported results. These findings are reported under M2 and M3 in the last four columns of Table 7 in the first Appendix.

## 4. Results and discussions

### 4.1 Overall results

Table 6 shows results of the 3SLS estimation of systems identified in equations (2) and (3) for all types of institutional ownerships, after controlling for industry-specific dummies. We report three sets of results: (i) first set of results are denoted by M1, where, no industry-specific dummies are used; (ii) the second set of results are labeled as M2, where, utility industry dummy (as in Demsetz and Lehn (1985) and Demsetz and Villalonga (2001)) and seven other industry-specific dummies are incorporated in the

[10] We have also reported table 8 in the appendix where estimation results are reported for pressure sensitive type institutional owners. But as we have pointed out earlier, these two tables point to the same interactive results.

estimation and (iii) the third set of results are termed as M3, where, except utility industry dummy, all other industry-specific dummies are employed in the estimation.[11]

Overall, the results point to the following important issues. First, for a cross-section of firms and institutional owners in Finland, where institutional owners control multiple equity stakes in different firms, there is considerable two-way feedback between business performances and controlling equity stakes related decision making. On the one hand, we find that business performances, measured by *Tobin's Q*, determine ownership stakes. On the other hand, ownership stakes considerably affect firm performance. Second, the magnitudes of the effects outlined above differ in the sense that ownership decisions are more sensitive to the business performance than the other way around. We find that ownership stakes adversely affects firm performance and the impact is very high (ranging around 2%) in comparison to the negative effect of firm performance on institutional ownership (hovering around 0.2%). Thirdly, the findings from the estimated equations are robust (remains negative and statistically significant) when we separately estimate the equations in presence of all individual industry-specific dummy variables as well as in presence of different institutional ownership-specific dummies.

Looking at the results from all types of institutional owners related estimation from Table 6, we conclude that institutional ownership adversely affects firm performance after controlling for debt-to-equity ratio (through *Levg*), capital expenditure (through *Kexp*), market risk (through *Mktrisk*) and firm size (through *Ln(Size)*). We find that with multiple institutional ownerships across firms, the business performance is adversely affected by 2% after maintaining the same debt-to-equity ratio, capital expenditure, market risk and firm size. This effect is robust (remains negative, significant and of the same magnitude) in presence of industry-specific dummies. This is an important result and it can be aligned with the recent findings by Thomsen *et al.* (2006) for continental Europe, though their focus is on blockholder ownership. Additionally, our finding can be interpreted as supporting Fama and Jensen's (1983) view that ownership

[11] We have also estimated models with different sets of industries and the findings from those validate the robustness of performance and ownership results. These models are not reported here due to space constraint but the findings are always available from the corresponding author.

adversely affects firm performance, though their result is suitable from blockholders perspective. It is interesting to note that our findings suggest that blockholders ownership and institutional ownership behave along the same line if we look at their impact on firm performance.

On the other hand, our findings also show that firm performance is not a positive determinant for ownership stakes. Firm performance or business performance, measured by *Tobin's Q* negatively affects ownership decisions to the extent of 0.2%, after controlling for debt-to-equity ratio, capital expenditure, market risk and firm size. Loderer and Martin (1997) also report that *Tobin's Q* is a negative predictor of insider ownership. Taken together, the above findings show significant two-way causality between firm performance and ownership, with institutional ownerships impact on firm performance being more pronounced.

Looking at the controls, we find that firm size plays a positive role in determining ownership stakes for institutions, thus, supporting earlier findings from La Porta, Lopez de Silanes, Shleifer and Vishny (2000). This is not consistent, however, in presence of dummies, but becomes robust for pressure sensitive owners later (see table 7 for reference). We find strong support for pecking order theory, as leverage adversely affects firm performance, and remains robust in presence of industry dummies. As argued in Demsetz and Lehn (1985) for managerial ownership context, we also find that market risk has a positive influence on institutional ownership for Finland. Within industries, only utilities industry exerts positive influence on equity ownership.

**4.2 Robustness check**

Tables 7 and 8 report robustness checks results with and *pressure-sensitive* institutional dummies interacted with performance and ownership measures, as outlined in equations (4) and (5) above. For non-interactive dummies, the results need to be interpreted in the following way. *Tobin's Q* in Table 7, for instance, shows the

performance impact from *pressure-sensitive* institutional owners as *Tobin's Q*dum_pr* reflects firm performance for *pressure-resistant* owners.

The robustness results from Table 7 clearly show support for Pound's (1988) argument, that for *pressure-sensitive* institutional owners, ownership stakes adversely affects performance and the extent is around 2%. This is in line with recent evidence from continental Europe in Thomsen *et al.* (2006). This finding remains consistent (in terms of statistical significance and negative sign) in presence of industry-specific dummies as well. It is important to note that in presence of industry-specific dummies, this adverse effect becomes more pronounced with magnitudes ranging around -3%. Therefore, in presence of industry-specific attributes, *pressure-sensitive* institutional ownership stakes affect business performances in much more adverse ways.

Similarly, for *pressure-sensitive* institutional owners, firm performance negatively affects (with the magnitude hovering around 0.2% to 0.3%) shareholding stakes, as in Loderer and Martin (1997). Therefore, considerable two way feedbacks exist between firm performance (*Tobin's Q*) and institutional ownership (*Share*). These are consistent and robust for *pressure-sensitive* institutional investors.

Considering the control variables, we find that firm size plays a positive role in determining ownership stakes for *pressure-sensitive* institutions, thus, supporting earlier findings from La Porta, Lopez de Silanes, Shleifer and Vishny (2000). We also find some support for pecking order theory for *pressure-sensitive* institutional owners, as leverage adversely affects firm performance, and remains robust in presence of industry dummies involving utilities. Within industries, utilities industry exerts positive influence on equity ownership for *pressure-sensitive* institutional owners.

Additional robustness checks in reported in Table 8 support earlier findings that institutional ownership stakes adversely affects performance, measured by *Tobin's Q*, for *pressure-resistant* firms as well. Table 8 also reports one interesting finding involving firm performance and institutional ownership. It shows that firm performance has no

influence on *pressure-resistant* institutional ownership stakes, which partially support the existing literatures (see, for instance, Demsetz and Villalonga (2001) and Thomsen *et al.* (2006)) finding that ownership decisions are invariant to firm performance.

## 5. Conclusion

This paper looks at a new dimension of ownership, *viz.*, institutional ownership (as posited in Pound (1988)) and it's interaction with firm performance for 116 firms across nine industries in Finland. Institutional ownership is separated between *pressure-sensitive* institutional owners (including insurance companies, banks, and non-bank trusts) and *pressure-resistant* owners (for instance, public pension funds, mutual funds, endowments and foundations). There is evidence that these institutional owners own stakes in multiple firms across industries, leading to a possible two way causality or endogeneity problem between firm performance and ownership structure. Three stage least squares (3SLS) is employed to address this problem for the first time in the literature. The choice of instruments in the 3SLS setup is carefully investigated. To explore firm performance and ownership issue in this framework, two exogenous variables (cash flow and sales growth) and four control variables (leverage, capital expenditure, market risk and firm size) are employed in accordance to the existing literature (see for example Demsetz and Villalonga (2001), Anderson and Reeb (2003)). Additionally, nine industry specific dummies for information technology industry, industrials industry, consumer discretionary industry, consumer staples industry, materials industry, healthcare industry, real estate industry, telecommunications industry and utilities industry are also used to check for robust and consistency in the results.

The results show that there is considerable two-way feedback between business performances and controlling equity stakes related decision making. The magnitudes of the effects outlined above differ in the sense that ownership decisions are more sensitive to the business performance than the other way around. We find that institutional ownership stakes adversely affects firm performance (as proposed in Pound (1988) for *pressure-sensitive* institutional owners) and the impact is very high in comparison to the

negative effect of firm performance on institutional ownership. This result can be aligned with the recent findings by Thomsen *et al.* (2006) for continental Europe, though their focus is on blockholder ownership. Also, our finding can be interpreted as supporting Fama and Jensen's (1983) view, albeit, from blockholders perspective. Findings from above remain robust when we separately estimate the equations in presence all individual industry-specific dummy variables as well as in presence of different institutional ownership-specific dummies. The results also show that, firm performance is not a positive determinant for institutional ownership stakes, as in Loderer and Martin's (1997) result regarding insider ownership. Additional robustness checks show that firm performance has no influence on institutional ownership stakes, which partially support the existing literatures (see, for instance, Demsetz and Villalonga (2001) and Thomsen *et al.* (2006)) finding that ownership decisions are invariant to firm performance.

## References


Anderson, R. C. & D. M. Reeb (2003). Founding-family ownership and firm performance: evidence from the S&P 500. *Journal of Finance* 3, 1301-1328.

Barclay, M. & C. G. Holderness (1990). Negotiated block trades and corporate control. Working paper, University of Rochester, Rochester, NY.

Baysinger, B. D. & H. N. Butler (1985). Corporate governance and the board of directors: Performance effects of changes in board composition. *Journal of Law, Economics, and Organization* 1, 101-124.

Bennedsen, M., K. M. Nielsen, F. Perez-Gonzalez & D. Wolfenzon (2006). Inside the family firm: The role of families in succession decisions and performance. *Quarterly Journal of Economics* forthcoming.

Bethel, J. E. & J. Liebeskind (1993). The effects of ownership structure on corporate restructuring. *Strategic Management Journal* 14, 15-31.

Black, B. S. (1992). Agents watching agents: The promise of institutional investor voice. *UCLA Law Review* 39, 811-893.

Brickley, J. A., R. C. Lease, & C.W. Smith (1988). Ownership structure and voting on ant takeover amendments, *Journal of Financial Economics* 20, 267-291.

Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73, 305-333.

Chaganti, R. & F. Damanpour (1991). Institutional ownership, capital structure and firm performance. *Strategic Management Journal* 12, 479-491.

Cho, Myeong-Hyeon (1998). Ownership structure, investment, and the corporate value: an empirical analysis. *Journal of Financial Economics* 47, 103-121.

Demsetz, H. (1983). The structure of ownership and the theory of the firm. *Journal of Law and Economics* 26, 375-390.

Demsetz, H., & K. Lehn (1985). The structure of corporate ownership: causes and consequences. *Journal of Political Economy* 93, 1155-1177.

Demsetz, H., & B. Villalonga (2001). Ownership structure and corporate performance. *Journal of Corporate Finance* 7, 209-233.

Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy* 88 (21), 288-307.

Fama, E. & M. Jensen (1983). Separation of ownership and control. *Journal of Law and Economics* 26, 301-325.

Gaved, M. (1997). Closing the communication gap: Disclosure and institutional shareholders. London: ICAEW.

Gilson, R. & M. Roe (1993): Understanding the Japanese keiretsu: overlaps between corporate governance and industrial organization. *Yale Law Journal* 102, 871-906.

Graves, S. B. (1988). Institutional ownership and corporate R&D in the computer industry. *Academy of Management Journal* 31 (2), 417-428.

Graves, S. B. & S. A. Waddock (1990). Institutional ownership and control: Implication for long-term corporate strategy. *Academy of Management Executive* 4, 75-83.

Hansen, G. S., & C. W. L. Hill (1991). Are institutional investors myopic? A time series study of four technology-driven industries. *Strategic Management* 12, 1-16.

Hausman, Jerry A. (1978). Specification tests in econometrics, Econometrica, 46, 1251-1272.

Hahn, J. & J. Hausman (2002). A new specification test for the validity of instrumental variables. *Econometrica* 70 (1), 163-189.

Hansen, L. (1982). Large sample properties of generalized method of moment estimators. *Econometrica* 50 (3), 1029-1054.

Heard, J. E. & H. D. Shepherd (1987) Conflicts of interest in proxy voting system. Investor Responsibility Research Center, Washington DC.

Hermalin, B. & M. Weisbach (1988). The determinants of board composition. *RAND Journal of Economics* 19, 589-606.

Himmelberg, C., Hubbard, R. G. & D. Palia (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics* 45, 223-255.

Hsiao, C. (1983). Identification. in Z. Griliches and M. Intriligator, Eds., *Handbook of Econometrics*, vol. 1. North-Holland Publishing Company, Amsterdam, The Netherlands.

Jarrell, G. A. & Lehn, H. (1985). Institutional Ownership, tender offers, and long-term investments. Washington, D. C., Office of the chief economist, Exchange Commission.

Jensen, M. & W. Meckling (1976). Theory of the firm: Managerial behavior, agency cost and ownership structure. *Journal of Financial Economics* 3, 305-360.

Kochhar, R. & P. David (1996). Institutional investors and firm innovation: a test of competing hypotheses. *Strategic Management Journal* 17, 73-84.

La Porta, R., Lopez de Silanes, F., Shleifer, A., & R. W. Vishny (2000). Investor protection and corporate valuation. *Journal of Financial Economics* 58, 3-27.

Loderer, C. & K. Martin (1997). Executive stock ownership and performance. *Journal of Financial Economics* 45, 223-255.

Lowenstein, L. (1991). Why managers should (and should not) have respect for their shareholders. *Journal of Corporation Law* 17, 1-27.

McConnell, J. J. & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial Economics* 27, 595-612.

Mikkelson, W. H., & R. S. Ruback (1991). An empirical analysis of the interfirm equity investment process. *Journal of Financial Economics* 14, 595-612.

Mikkelson, W. H., & R. S. Ruback (1991). Targeted repurchases and common stock returns. *Rand Journal of Economics* 22 (4), 544-561.

Pound, J. (1988). Proxy contests and the efficiency of shareholder oversight. *Journal of Financial Economics* 20, 237-265.

Roe, M. (1994). Strong mergers, weak owners: the political roots of American corporate finance. Princeton University Press, Princeton, NJ.

Sargan, J. (1958). The estimation of economic relationships using instrumental variables. *Econometrica* 26 (3), 393-415.

Seifert, B., H. Gonenc, & J. Wright (2005). The international evidence on performance and equity ownership by insiders, blockholders, and institutions. *Journal of Multinational Financial Management* 15, 171-191.

Shleifer, A. & R. W. Vishny (1986). Large shareholders and corporate control. *Journal of Political Economy* 94 (3), 461-488.

Short, H. (1994). Ownership, control, financial structure and the performance of firms. *Journal of Economic Surveys* 8 (3), 203-249.

Staiger, D. & J. H. Stock (1997). Instrumental variables regression with weak instruments. *Econometrica* 65 (3), 557-586.

Stultz, R. M. (1988). Managerial control of voting rights: financing policies and the market for corporate control. *Journal of Financial Economics* 20, 25-54.

Sykes, A. (1994). Proposals for internally competitive corporate governance in Britain and America. *Corporate Governance: An International Review* 2 (4), 187-195.

Thomsen, S., T., Pedersen & H. K. Kvist (2006). Blockholder ownership: effects on firm value in market and control based governance systems. *Journal of Corporate Finance* 12, 246-269.

White, Halbert (1980). A heteroskedasticity-consistent covariance matrix and a direct test for heteroskedasticity. *Econometrica* 48, 817-838.

# Appendix 1: Tables

**Table 1.** Descriptive Statistics for *All Types* of Institutional Owners

| Variables | Mean | Median | Standard deviation | Maximum | Minimum | Skewness | No. of obs. |
|---|---|---|---|---|---|---|---|
| *Tobin's Q* | 1.154 | 0.958 | 0.740 | 4.526 | 0.117 | 2.407 | 180 |
| *ROE* | 7.417 | 7.100 | 25.196 | 189.500 | -57.000 | 3.824 | 180 |
| *Share* | 0.017 | 0.002 | 0.055 | 0.366 | 0.000 | 5.000 | 180 |
| *Vote* | 0.019 | 0.001 | 0.057 | 0.366 | 0.000 | 4.661 | 180 |
| *Levg* | 0.240 | 0.244 | 0.165 | 0.630 | 0.000 | 0.266 | 180 |
| *Kexp* | 8.240 | 6.008 | 9.620 | 72.472 | 0.320 | 4.384 | 180 |
| *Mktrisk* | 0.033 | 0.029 | 0.017 | 0.133 | 0.016 | 2.888 | 180 |
| *Size* | 1386.430 | 120.900 | 3883.102 | 22456.000 | 8.506 | 4.015 | 180 |
| *Cashf* | 1.279 | 0.809 | 1.829 | 12.116 | -0.288 | 3.549 | 180 |
| *Salesg* | 0.071 | 0.025 | 0.213 | 1.576 | -0.246 | 4.231 | 180 |

Notes: *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth.

**Table 2.** Descriptive Statistics for *Pressure Resistant* Type Institutional Owners

| Variables | Mean | Median | Standard deviation | Maximum | Minimum | Skewness | No. of obs. |
|---|---|---|---|---|---|---|---|
| *Tobin's Q* | 1.145 | 0.956 | 0.739 | 4.526 | 0.117 | 2.422 | 92 |
| *ROE* | 6.818 | 7.050 | 25.475 | 189.500 | -57.000 | 3.643 | 92 |
| *Share* | 0.011 | 0.001 | 0.043 | 0.361 | 0.000 | 6.411 | 92 |
| *Vote* | 0.014 | 0.001 | 0.048 | 0.361 | 0.000 | 5.338 | 92 |
| *Levg* | 0.243 | 0.248 | 0.167 | 0.630 | 0.000 | 0.236 | 92 |
| *Kexp* | 8.310 | 5.963 | 9.719 | 72.472 | 0.320 | 4.222 | 92 |
| *Mktrisk* | 0.034 | 0.028 | 0.017 | 0.133 | 0.016 | 2.683 | 92 |
| *Size* | 1355.001 | 119.027 | 3856.649 | 22456.000 | 8.506 | 4.065 | 92 |
| *Cashf* | 1.225 | 0.818 | 1.818 | 12.116 | -0.288 | 3.585 | 92 |
| *Salesg* | 0.076 | 0.025 | 0.217 | 1.576 | -0.246 | 3.883 | 92 |

Notes: *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth.

**Table 3.** Descriptive Statistics for *Pressure Sensitive* Type Institutional Owners

| Variables | Mean | Median | Standard deviation | Maximum | Minimum | Skewness | No. of obs. |
|---|---|---|---|---|---|---|---|
| *Tobin's Q* | 1.163 | 0.967 | 0.754 | 4.526 | 0.117 | 2.393 | 88 |
| *ROE* | 8.042 | 7.450 | 25.031 | 189.500 | -57.000 | 4.033 | 88 |
| *Share* | 0.022 | 0.002 | 0.066 | 0.366 | 0.000 | 4.154 | 88 |
| *Vote* | 0.022 | 0.002 | 0.066 | 0.366 | 0.000 | 4.110 | 88 |
| *Levg* | 0.239 | 0.241 | 0.163 | 0.630 | 0.000 | 0.299 | 88 |
| *Kexp* | 8.166 | 6.067 | 9.570 | 72.472 | 0.320 | 4.561 | 88 |
| *Mktrisk* | 0.032 | 0.028 | 0.016 | 0.133 | 0.016 | 3.143 | 88 |
| *Size* | 1419.288 | 127.924 | 3932.404 | 22456.000 | 11.918 | 3.964 | 88 |
| *Cashf* | 1.303 | 0.889 | 1.850 | 12.116 | -0.240 | 3.514 | 88 |
| *Salesg* | 0.066 | 0.025 | 0.211 | 1.576 | -0.246 | 4.415 | 88 |

Notes: *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth.

**Table 4.** Correlation Data for *All Types* of Institutional Owners

| Variables | *Tobin's Q* | *ROE* | *Share* | *Vote* | *Levg* | *Kexp* | *Mktrisk* | *Size* | *Cashf* |
|---|---|---|---|---|---|---|---|---|---|
| *Tobin's Q* | 1.000 | | | | | | | | |
| *ROE* | 0.258 | 1.000 | | | | | | | |
| *Share* | -0.129 | -0.049 | 1.000 | | | | | | |
| *Vote* | -0.124 | -0.040 | 0.983 | 1.000 | | | | | |
| *Levg* | -0.281 | 0.087 | 0.032 | 0.029 | 1.000 | | | | |
| *Kexp* | -0.171 | 0.180 | -0.041 | -0.037 | -0.031 | 1.000 | | | |
| *Mktrisk* | 0.162 | -0.074 | 0.091 | 0.122 | -0.239 | -0.215 | 1.000 | | |
| *Size* | 0.116 | 0.022 | 0.133 | 0.169 | 0.067 | -0.096 | -0.086 | 1.00 | |
| *Cashf* | -0.245 | 0.084 | -0.029 | -0.025 | -0.027 | 0.338 | -0.248 | 0.078 | 1.000 |
| *Salesg* | 0.070 | 0.281 | -0.053 | -0.056 | -0.117 | 0.028 | -0.096 | -0.084 | -0.065 |

Notes: *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth.

**Table 5.** Validity of Instruments

| Instruments | Hausman's Test | Relevance | Correlation | Overidentification |
|---|---|---|---|---|
| *ROE* | -0.007 | 9.121*** | 0.258 | 28.810 |
| *Industry dummies* | -0.009 | 7.087*** | | |
| *Vote* | -1.429 | 746.849*** | 0.983 | 44.170** |
| *Industry dummies* | -3.154 | 341.925*** | | |

Notes: 'Hausman's test' is reporting the coefficient of the residuals in the second stage regression. Under 'Relevance', we are reporting the joint significance of the F-test statistics when we regress the endogenous variable on instrument and all other exogenous variables. 'Correlation' shows simple relationship between the endogenous variable and possible instruments. Under 'Overidentification', we perform Sargan's test with the null hypothesis that all instruments are orthogonal to the error term. *** denotes 1%, ** denotes 5% and * denotes 10% level of significance.

(Estimation results table (table 6) and robustness check results tables (table 7 and table 8) continue on pages 27 to 31)

**Table 6.** 3SLS Results for *All Types* of Institutional Owners

| Variables | M1 | M1 | M2 | M2 | M3 | M3 |
|---|---|---|---|---|---|---|
| | Dep.var: *Tobin's Q* | Dep.var: *Share* | Dep.var: *Tobin's Q* | Dep.var: *Share* | Dep.var: *Tobin's Q* | Dep.var: *Share* |
| *Constant* | 1.700*** | 0.001 | 2.101*** | -0.001 | 1.652*** | 0.144*** |
| | (0.237) | (0.024) | (0.434) | (0.040) | (0.494) | (0.041) |
| *Tobin's Q* | | -0.018*** | | -0.015** | | -0.015** |
| | | (0.008) | | (0.008) | | (0.008) |
| *Share* | -1.974*** | | -1.968*** | | -1.968*** | |
| | (0.917) | | (0.923) | | (0.923) | |
| *Levg* | -1.203*** | -0.014 | -0.752*** | 0.001 | -0.752*** | 0.001 |
| | (0.323) | (0.027) | (0.363) | (0.029) | (0.363) | (0.029) |
| *Kexp* | -0.008* | -0.000 | -0.006 | -0.001 | -0.006 | -0.001 |
| | (0.006) | (0.000) | (0.005) | (0.001) | (0.005) | (0.001) |
| *Mktrisk* | 1.704 | 0.517*** | -2.978 | 0.378* | -2.978 | 0.378* |
| | (3.255) | (0.261) | (3.212) | (0.259) | (3.212) | (0.259) |
| *Ln(Size)* | -0.015 | 0.004*** | -0.014 | 0.002 | -0.014 | 0.002 |
| | (0.029) | (0.002) | (0.030) | (0.003) | (0.030) | (0.003) |
| *Cashf* | -0.083*** | | -0.034 | | -0.034 | |
| | (0.030) | | (0.030) | | (0.030) | |
| *Salesg* | | 0.001 | | 0.005 | | 0.005 |
| | | (0.019) | | (0.019) | | (0.019) |
| *Ites* | | | -0.054 | 0.018 | 0.396 | -0.127*** |
| | | | (0.354) | (0.029) | (0.420) | (0.032) |
| *Inds* | | | -0.632** | 0.010 | -0.181 | -0.136*** |
| | | | (0.339) | (0.028) | (0.408) | (0.031) |
| *Cond* | | | -0.456 | -0.002 | -0.006 | -0.148*** |
| | | | (0.353) | (0.029) | (0.424) | (0.032) |
| *Stap* | | | -0.907*** | -0.003 | -0.458 | -0.149*** |
| | | | (0.363) | (0.030) | (0.435) | (0.033) |
| *Mate* | | | -0.599* | 0.024 | -0.149 | -0.121*** |
| | | | (0.352) | (0.029) | (0.411) | (0.031) |
| *Heal* | | | -0.367 | 0.002 | 0.082 | -0.143*** |
| | | | (0.465) | (0.038) | (0.516) | (0.040) |
| *Rest* | | | -0.634* | 0.001 | -0.185 | -0.145*** |
| | | | (0.418) | (0.034) | (0.487) | (0.037) |
| *Tele* | | | | | 0.450 | -0.145*** |
| | | | | | (0.518) | (0.040) |
| *Util* | | | -0.450 | 0.145*** | | |
| | | | (0.518) | (0.040) | | |
| *Adjusted R square* | 0.143 | 0.014 | 0.203 | 0.094 | 0.203 | 0.094 |

Notes: *** denotes 1%, ** denotes 5% and * denotes 10% level of significance. Standard errors are reported in parentheses. *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth. *Ites* is information technology industry dummy; *Inds* is industrials dummy; *Cond* is consumer discretionary industry dummy; *Stap* is consumer staples industry dummy; *Mate* represents materials industry; *Heal* is healthcare industry dummy; *Rest* is real estate industry dummy; *Tele* is telecommunication industry dummy and *Util* is utilities industry dummy. We use *ROE* as an instrument for performance and *Vote* as an instrument for ownership share. Above results are generated using a combination of individual instruments and interactive instruments with other controls, exogenous variables and industry-specific dummies.

**Table 7.** 3SLS Results for *All Types* of Institutional Owners: Robustness Check

| Variables | M1 | M1 | M2 | M2 | M3 | M3 |
|---|---|---|---|---|---|---|
| | Dep.var: *Tobin's Q* | Dep.var: *Share* | Dep.var: *Tobin's Q* | Dep.var: *Share* | Dep.var: *Tobin's Q* | Dep.var: *Share* |
| *Constant* | 1.697*** | -0.009 | 2.030*** | 0.008 | 1.751*** | 0.136*** |
| | (0.237) | (0.022) | (0.434) | (0.037) | (0.506) | (0.038) |
| *Tobin's Q* | | -0.018*** | | -0.027*** | | -0.026** |
| | | (0.009) | | (0.012) | | (0.014) |
| *Tobin's Q*dum_pr* | | 0.011 | | 0.011 | | 0.011 |
| | | (0.012) | | (0.021) | | (0.024) |
| *Share* | -1.777* | | -3.464*** | | -3.063*** | |
| | (1.152) | | (1.273) | | (1.244) | |
| *Share*dum_pr* | -1.422 | | -1.233 | | -1.483 | |
| | (2.079) | | (2.069) | | (2.066) | |
| *Levg* | -1.269*** | -0.020 | -0.752* | -0.000 | -0.725 | 0.016 |
| | (0.457) | (0.036) | (0.514) | (0.038) | (0.528) | (0.040) |
| *Levg*dum_pr* | 0.139 | 0.027 | 0.102 | 0.010 | 0.019 | -0.023 |
| | (0.621) | (0.047) | (0.684) | (0.049) | (0.418) | (0.054) |
| *Kexp* | -0.010 | -0.001 | -0.006 | -0.000 | -0.006 | 0.000 |
| | (0.007) | (0.001) | (0.007) | (0.001) | (0.008) | (0.001) |
| *Kexp*dum_pr* | 0.002 | 0.001 | 0.001 | -0.000 | -0.000 | -0.001 |
| | (0.010) | (0.001) | (0.010) | (0.000) | (0.011) | (0.000) |
| *Mktrisk* | 1.500 | -0.005 | -4.040 | -0.171 | -3.078 | 0.068 |
| | (4.090) | (0.336) | (4.617) | (0.340) | (4.674) | (0.350) |
| *Mktrisk*dum_pr* | 0.337 | 0.934*** | 3.951 | 0.917*** | 2.061 | 0.457 |
| | (4.644) | (0.405) | (6.032) | (0.435) | (6.217) | (0.455) |
| *Ln(Size)* | -0.009 | 0.011*** | -0.005 | 0.007*** | 0.005 | -0.010*** |
| | (0.038) | (0.003) | (0.041) | (0.003) | (0.042) | (0.003) |
| *Ln(Size)*dum_pr* | -0.016 | -0.012*** | -0.009 | -0.007*** | -0.037 | -0.015*** |
| | (0.044) | (0.003) | (0.054) | (0.004) | (0.053) | (0.003) |
| *Cashf* | -0.082*** | | -0.036 | | -0.033 | |
| | (0.042) | | (0.042) | | (0.042) | |
| *Cash*dum_pr* | -0.001 | | -0.002 | | -0.005 | |
| | (0.060) | | (0.060) | | (0.060) | |
| *Salesg* | | 0.007 | | 0.010 | | 0.020 |
| | | (0.027) | | (0.025) | | (0.026) |
| *Salesg*dum_pr* | | -0.011*** | | -0.014 | | -0.033 |
| | | (0.003) | | (0.035) | | (0.036) |
| *Ites* | | | 0.095 | 0.024 | 0.271 | -0.134*** |
| | | | (0.413) | (0.034) | (0.478) | (0.036) |
| *Ites*dum_pr* | | | -0.195 | -0.007 | 0.027 | 0.053 |
| | | | (0.404) | (0.040) | (0.428) | (0.051) |
| *Inds* | | | -0.543 | 0.012 | -0.369 | -0.146** |
| | | | (0.384) | (0.029) | (0.452) | (0.032) |
| *Inds*dum_pr* | | | -0.094 | -0.011 | 0.141 | 0.053 |
| | | | (0.377) | (0.030) | (0.407) | (0.039) |
| *Cond* | | | -0.333 | -0.004 | -0.161 | -0.166*** |
| | | | (0.422) | (0.032) | (0.498) | (0.034) |
| *Cond*dum_pr* | | | -0.218 | -0.004 | 0.024 | 0.065 |
| | | | (0.446) | (0.036) | (0.477) | (0.046) |
| *Stap* | | | -0.846** | -0.017 | -0.675 | -0.179*** |
| | | | (0.438) | (0.032) | (0.514) | (0.035) |
| *Stap*dum_pr* | | | -0.064 | 0.014 | 0.181 | 0.084*** |
| | | | (0.501) | (0.036) | (0.539) | (0.042) |

**Table 7.** 3SLS Results for *All Types* of Institutional Owners: Robustness Check (continued)

| Variables | M1 Dep.var: *Tobin's Q* | M1 Dep.var: *Share* | M2 Dep.var: *Tobin's Q* | M2 Dep.var: *Share* | M3 Dep.var: *Tobin's Q* | M3 Dep.var: *Share* |
|---|---|---|---|---|---|---|
| *Mate* | | | -0.395 | 0.039 | -0.267 | -0.128*** |
| | | | (0.440) | (0.032) | (0.481) | (0.034) |
| *Mate*dum_pr* | | | -0.288 | -0.041 | 0.030 | 0.041 |
| | | | (0.514) | (0.038) | (0.538) | (0.046) |
| *Heal* | | | -0.308 | 0.002 | -0.121 | -0.157*** |
| | | | (0.581) | (0.044) | (0.633) | (0.045) |
| *Heal*dum_pr* | | | -0.079 | 0.001 | 0.136 | 0.063 |
| | | | (0.705) | (0.056) | (0.718) | (0.063) |
| *Rest* | | | -0.561 | -0.008 | -0.395 | -0.174*** |
| | | | (0.537) | (0.040) | (0.611) | (0.043) |
| *Rest*dum_pr* | | | -0.127 | 0.004 | 0.144 | 0.081 |
| | | | (0.677) | (0.050) | (0.712) | (0.058) |
| *Tele* | | | | | 0.224 | -0.170*** |
| | | | | | (0.661) | (0.048) |
| *Tele*dum_pr* | | | | | 0.151 | -0.084 |
| | | | | | (0.805) | (0.071) |
| *Util* | | | 0.184 | 0.211*** | | |
| | | | (0.664) | (0.044) | | |
| *Util*dum_pr* | | | -1.135 | -0.218*** | | |
| | | | (0.953) | (0.067) | | |
| *Adjusted R square* | 0.115 | 0.087 | 0.118 | 0.168 | 0.117 | 0.131 |

Notes: *** denotes 1%, ** denotes 5% and * denotes 10% level of significance. Standard errors are reported in parentheses. *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth. *Ites* is information technology industry dummy; *Inds* is industrials dummy; *Cond* is consumer discretionary industry dummy; *Stap* is consumer staples industry dummy; *Mate* represents materials industry; *Heal* is healthcare industry dummy; *Rest* is real estate industry dummy; *Tele* is telecommunication industry dummy and *Util* is utilities industry dummy. *dum_pr* stands for pressure sensitive type institutional ownership dummy. Non-interactive terms are denoting effects of the other type of institutional ownership. We use *ROE* as an instrument for performance and *Vote* as an instrument for ownership share. Above results are generated using a combination of individual instruments and interactive instruments with other controls, exogenous variables and industry-specific dummies.

**Table 8.** 3SLS Results for *All Types* of Institutional Owners: Additional Robustness Check

| Variables | M1 | M1 | M2 | M2 | M3 | M3 |
|---|---|---|---|---|---|---|
| | Dep.var: *Tobin's Q* | Dep.var: *Share* | Dep.var: *Tobin's Q* | Dep.var: *Share* | Dep.var: *Tobin's Q* | Dep.var: *Share* |
| *Constant* | 1.697*** | -0.009 | 2.079*** | -0.005 | 1.609*** | 0.126*** |
| | (0.237) | (0.022) | (0.433) | (0.036) | (0.507) | (0.039) |
| *Tobin's Q* | | -0.006 | | -0.010 | | -0.009 |
| | | (0.009) | | (0.013) | | (0.014) |
| *Tobin's Q*dum_ps* | | -0.011 | | -0.011 | | -0.012 |
| | | (0.012) | | (0.020) | | (0.024) |
| *Share* | -3.200** | | -3.181** | | -3.125** | |
| | (1.736) | | (1.651) | | (1.656) | |
| *Share*dum_ps* | 1.422 | | 0.947 | | 1.384 | |
| | (2.079) | | (2.087) | | (2.083) | |
| *Levg* | -1.129*** | 0.006 | -0.683 | 0.014 | -0.716* | -0.003 |
| | (0.441) | (0.034) | (0.485) | (0.035) | (0.494) | (0.037) |
| *Levg*dum_ps* | -0.139 | -0.027 | -0.083 | -0.009 | -0.042 | 0.023 |
| | (0.621) | (0.047) | (0.684) | (0.049) | (0.718) | (0.054) |
| *Kexp* | -0.007 | -0.000 | -0.006 | -0.000 | -0.006 | -0.000 |
| | (0.008) | (0.000) | (0.008) | (0.001) | (0.007) | (0.000) |
| *Kexp*dum_ps* | -0.002 | -0.000 | -0.001 | 0.000 | -0.000 | 0.000 |
| | (0.010) | (0.000) | (0.010) | (0.000) | (0.011) | (0.000) |
| *Mktrisk* | 1.838 | 0.930*** | -1.323 | 0.773*** | -1.897 | 0.551** |
| | (4.008) | (0.306) | (4.284) | (0.303) | (4.361) | (0.313) |
| *Mktrisk*dum_ps* | -0.337 | -0.934*** | -2.590 | -0.923*** | -1.369 | -0.462 |
| | (4.644) | (0.405) | (6.034) | (0.435) | (6.219) | (0.455) |
| *Ln(Size)* | -0.025 | -0.000 | -0.013 | -0.001 | -0.024 | -0.005** |
| | (0.036) | (0.002) | (0.039) | (0.003) | (0.038) | (0.002) |
| *Ln(Size)*dum_ps* | 0.016 | 0.012*** | -0.001 | 0.008*** | 0.017 | 0.015*** |
| | (0.044) | (0.003) | (0.054) | (0.004) | (0.053) | (0.003) |
| *Cashf* | -0.083*** | | -0.037 | | -0.038 | |
| | (0.043) | | (0.043) | | (0.043) | |
| *Cash*dum_ps* | 0.001 | | 0.003 | | 0.007 | |
| | (0.060) | | (0.060) | | (0.060) | |
| *Salesg* | | -0.004 | | -0.000 | | -0.010 |
| | | (0.025) | | (0.024) | | (0.024) |
| *Salesg*dum_ps* | | 0.011 | | 0.015 | | 0.034 |
| | | (0.036) | | (0.035) | | (0.036) |
| *Ites* | | | -0.135 | 0.019 | 0.414 | -0.083** |
| | | | (0.402) | (0.032) | (0.492) | (0.044) |
| *Ites*dum_ps* | | | 0.213 | 0.005 | 0.070 | -0.054 |
| | | | (0.404) | (0.041) | (0.428) | (0.052) |
| *Inds* | | | -0.663** | 0.006 | -0.105 | -0.093*** |
| | | | (0.389) | (0.029) | (0.487) | (0.039) |
| *Inds*dum_ps* | | | 0.088 | 0.010 | -0.065 | -0.054 |
| | | | (0.377) | (0.030) | (0.407) | (0.039) |
| *Cond* | | | -0.560 | -0.003 | 0.000 | -0.102*** |
| | | | (0.412) | (0.032) | (0.000) | (0.042) |
| *Cond*dum_ps* | | | 0.225 | 0.003 | 0.073 | -0.065 |
| | | | (0.447) | (0.037) | (0.477) | (0.046) |
| *Stap* | | | -0.940*** | 0.004 | -0.378 | -0.095*** |
| | | | (0.441) | (0.032) | (0.538) | (0.041) |
| *Stap*dum_ps* | | | 0.086 | -0.016 | -0.069 | -0.085*** |
| | | | (0.502) | (0.036) | (0.539) | (0.042) |

**Table 8.** 3SLS Results for All Types of Institutional Owners: Additional Robustness Check (continued)

| Variables | M1 Dep.var: *Tobin's Q* | M1 Dep.var: *Share* | M2 Dep.var: *Tobin's Q* | M2 Dep.var: *Share* | M3 Dep.var: *Tobin's Q* | M3 Dep.var: *Share* |
|---|---|---|---|---|---|---|
| *Mate* | | | -0.706* | 0.004 | -0.123 | -0.087*** |
| | | | (0.430) | (0.033) | (0.519) | (0.041) |
| *Mate*dum_ps* | | | 0.246 | 0.039 | 0.031 | -0.042 |
| | | | (0.514) | (0.038) | (0.538) | (0.046) |
| *Heal* | | | -0.405 | 0.005 | 0.146 | -0.096** |
| | | | (0.581) | (0.044) | (0.642) | (0.052) |
| *Heal*dum_ps* | | | 0.093 | -0.001 | -0.042 | -0.063 |
| | | | (0.706) | (0.056) | (0.717) | (0.063) |
| *Rest* | | | -0.703 | 0.000 | -0.128 | -0.092*** |
| | | | (0.536) | (0.040) | (0.614) | (0.048) |
| *Rest*dum_ps* | | | 0.138 | -0.004 | -0.031 | -0.082 |
| | | | (0.677) | (0.050) | (0.538) | (0.058) |
| *Tele* | | | | | 0.506 | -0.089** |
| | | | | | (0.668) | (0.055) |
| *Tele*dum_ps* | | | | | -0.032 | -0.086 |
| | | | | | (0.805) | (0.072) |
| *Util* | | | -0.970 | -0.000 | | |
| | | | (0.763) | (0.056) | | |
| *Util*dum_ps* | | | 0.876 | 0.216*** | | |
| | | | (0.953) | (0.067) | | |
| *Adjusted R square* | 0.115 | 0.087 | 0.136 | 0.184 | 0.134 | 0.147 |

Notes: *** denotes 1%, ** denotes 5% and * denotes 10% level of significance. Standard errors are reported in parentheses. *Tobin's Q* measures firm performance; *ROE* stands for return on equity, which is an alternative measure for performance; *Share* denotes the Herfindahl index of ownership shares by institutional shareholders; *Vote* is an alternative Herfindahl index of ownership based on owners voting rights; *Levg* denotes leverage; *Kexp* measures capital expenditure; *Mktrisk* stands for market risk measured as the standard deviation of monthly stock returns for prior sixty months; *Size* depicts firm size; *Cashf* denotes cash flow and *Salesg* shows sales growth. *Ites* is information technology industry dummy; *Inds* is industrials dummy; *Cond* is consumer discretionary industry dummy; *Stap* is consumer staples industry dummy; *Mate* represents materials industry; *Heal* is healthcare industry dummy; *Rest* is real estate industry dummy; *Tele* is telecommunication industry dummy and *Util* is utilities industry dummy. *Dum_ps* stands for pressure sensitive type institutional ownership dummy. Non-interactive terms are denoting effects of the other type of institutional ownership. We use *ROE* as an instrument for performance and *Vote* as an instrument for ownership share. Above results are generated using a combination of individual instruments and interactive instruments with other controls, exogenous variables and industry-specific dummies.

# Appendix 2: Data Details

**Variables, definitions, and sources**

| Variable | Definition | Sources |
|---|---|---|
| *Tobin's Q* | Sum of year-end market value of common stock and book value of total debt divided by book value of total debt. | Thomson Financial |
| *Herfindahl Index* | Sum of equity stakes held by individual institutional investors firms in the dataset. | Firm's annual reports |
| *_pr* | Pressure resistant institutional investors. That is, institutional investors with only an investment relationship with the firm in which they own equity. | Firms' annual reports |
| *_ps* | Pressure sensitive institutional investors. That is, institutional investors who are likely to have both an investment and business relations with the firm in which they have equity stakes. | Firms' annual reports |
| *ROE* | Return on equity | Thomson Financial |
| *Vote* | Herfindahl index of ownership based on the proportion of decisive votes with the institutional investors. | Firms' annual reports |
| *Salesg* | Firm's 5-year sales growth | Thomson financial |
| *Cashf* | Cash flow divided by total assets | Thomson Financial |
| *Levg* | Total debt scaled by total assets | Thomson Financial |
| *Kexp* | Capital expenditures scaled by total assets | Thomson Financial |
| *Mktrisk* | Standard deviation of monthly stock returns Over a sixty month period | Helsinki Stock Exchange |
| *Ln(Size)* | Natural logarithm of total assets | Thompson Financial |
| *Ites* | Industry dummy: Information technology | Helsinki Stock Exchange |
| *Inds* | Industry dummy: industrials | Helsinki Stock Exchange |
| *Cond* | Industry dummy: consumer discretionary | Helsinki Stock Exchange |
| *Stap* | Industry dummy: consumer staples | Helsinki Stock Exchange |

(Data details table continues on next page)

| Variable | Definition | Sources |
|---|---|---|
| *Mate* | Industry dummy: materials | Helsinki Stock Exchange |
| *Heal* | Industry dummy: healthcare | Helsinki Stock Exchange |
| *Rest* | Industry dummy: real estate | Helsinki Stock Exchange |
| *Tele* | Industry dummy: telecommunication | Helsinki Stock Exchange |
| *Util* | Industry dummy: utility | Helsinki Stock Exchange |