Management Ownership and Firm Value: An Empirical Analysis using Panel Data

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A majority of existing empirical studies report different relation between ownership and firm value using different sets of cross-sectional data. In this paper, we re-estimate the relation between management ownership and firm value after controlling for the history of management ownership as well as inter-firm differences using a panel data set. Further, we consider the possibility that the current ownership structure is jointly determined with the firm value, an endogeneity argument a la Demsetz (1983). We find that history of the management ownership, not its current level, matters in determining the firm value, which is consistent with information asymmetry arguments.

Keywords: Convergence-of-interest, Entrenchment, Information asymmetry, Management ownership, Panel data

JEL Classification: C23, C81, D23

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I. Introduction

In this paper, we revisit an old issue on the relation between management ownership and firm's value. Empirically identifying the relation between ownership structure and firm value is a long standing issue in corporate finance. This paper addresses the same issue using a panel data set on 11 firms collected over 10 year periods. This paper argues that using a panel data set, the issue can be better addressed as endogeneity can be more adequately dealt with, that inter-firm differences can be better controlled, and that history of ownership changes can be accounted for.

Arguing that a firm's ownership structure is endogenously determined to maximize its shareholders' interest, Demsetz (1983) says that there is no single, clear cut relation between ownership structure and firm value. Demsetz and Lehn (1985) present evidences supporting Demsetz's arguments. They regress accounting profit rates of 511 U.S. companies in 1980 on different measures of ownership concentration and they find no significant coefficient.

In contrast, two subsequent papers, Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990), report quite different findings. Morck, Shleifer, and Vishny estimate a piece-wise linear regression in which the dependent variable is Tobin's Q and the primary independent variable is the fraction of shares owned by corporate management. Using a cross-section sample of 371 Fortune 500 firms for 1980, they find that Q first rises as management ownership increases to 5%, falls as ownership increases to 25%, and rises slightly at higher ownership levels. Replacing Tobin's Q with profit rates does not change the findings. They mention that their results appear at odds with the findings of Demsetz and Lehn. They suggest that Demsetz and Lehn fail to capture the non-monotonic relationship that they have found by estimating a mis-specified linear model.

McConnell and Servaes (1990) investigate the cross-sectional relation between Tobin's Q and management equity ownership for a sample of 1,173 firms in 1976 and for another sample of 1,093 firms in 1986 that are listed on either the New York Stock Exchange or the American Stock Exchange. For both samples, they find a significant curvilinear relation between Tobin's Q and the management ownership. Q first increases, and then decreases, as the shares become concentrated in the hands of managers and board members. Their results are consistent with

neither Demsetz's (1983) theoretical arguments nor Demsetz and Lehn's (1985) empirical findings. They do not offer any possible theoretical or empirical explanation for the inconsistency, though.

These, among others, empirical results are mutually contradictory. How could these conflicting results coexist side by side? In this paper, we re-investigate the relation between management ownership and firm value using panel data rather than cross-sectional data. The advantage of using panel data is that we are able to control for unobservable firm-specific attributes and past history of insider ownership to better single out the relationship between the inside management ownership and the firm value.

According to Demsetz (1983), insider ownership is endogenously determined to maximize the firm value given firm-specific characteristics. If so, better controlling for firm-specific effects, observed or not, and for ownership history, would mitigate the endogeneity problem of the current ownership variable. Further, by using panel data, we allow for the possibility that the ownership variable is still endogenous. Accounting for endogeneity is easier in the panel data setting than in the cross-sectional data.

Cross-sectional studies would make sense only when the management shareholding is stable over time. Seyhun (1992) reports that in spite of the increased statutory sanctions of the 1980s on the insider trading, data show increases in volume and abnormal profits of insider trading over time. The management shareholding is not stable. Unlike cross-sectional data, panel data allows one to take into account the effect on the firm value of the history of management ownership.

Under information asymmetry between the management and the outside investors, intensive insider trading raises the possibility that the informed management exploits the uninformed outside investors. When we run regression of a measure of firm performance on a measure of the extent of insider trading, we expect its coefficient to be negative: "outsiders asking for discount in those stocks with frequent inside trading." Outside investors, on the other hand, take changes in the management ownership between the previous year and the current year, as a credible signal about the firm's future profitability. When we run regression of a measure of firm performance on a measure of the change in management ownership, we expect its coefficient to be positive: "outsiders perceiving recent buildup of insider shares as a credible signal for good news."

The above arguments imply that firms with identical management shareholding at a specific point in time possibly display quite different corporate values. To illustrate, consider two firms with the same level of current management shareholding. First, if one firm's management has reached the current level of shareholding after a sequence of frequent buys and sells, the firm's future profitability would be lower than that of the other firm that has recorded less frequent changes in the management shareholding. Second, if one firm's management reduces its shareholding recently, the firm's future profitability would be lower than that of the other firm that has stable management shareholding.

Without controlling for the history of management shareholdings, we face difficulties in identifying relation between management shareholding and firm value. Cross-sectional analyses, by nature, cannot take into account the history of management shareholdings. Empirical findings in cross-sectional studies much depend on the specific sample being used, which explains why many previous studies report mutually conflicting results (see, for example, Demsetz 1995).

Let alone previous cross-sectional studies like Demsetz and Lehn (1985), Morck *et al.* (1988), McConnell and Servaes (1990), Cho (1998), Claessens *et al.* (2000), Ang *et al.* (2000), and Lemmon and Lins (2003), most previous panel studies like Lins (2003), Cronqvist and Nilsson (2003), Villalonga and Amit (2006), and Lin *et al.* (2011) do not take into account the management ownership history, resulting in specification errors and biased estimates.[1]

Another advantage of using panel data lies in that one can better control for unobserved inter-firm differences as well as for observed ones. Many of the firm characteristics are not observable to outside empirical researchers. Panel data allow us to better control for unobserved inter-firm differences, enabling us to better identify the relation between management ownership and firm's value. Panel data analyses of this paper, by being able to control for unobservable inter-firm differences and history of management ownership, are expected to better reveal the relationship between management ownership and the firm value.[2]

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[1] See Ryu and Yoo (2011) for a review of empirical studies on relationship between ownership and firm value.

[2] Ryu and Yoo (2011) use panel data on the business group affiliated firms in Korea to address the relationship between the management ownership and firm value whereas this paper uses panel data on standalone firms in the U.S.

The rest of the paper is organized as follows. Section II reviews the existing literature on the relation between the management ownership and the firm value. Section III compares different performance measures. Section IV draws testable hypotheses. Section V explains the data and presents the estimation results. Section VI concludes the paper.

II. Ownership structure and corporate value

According to Berle and Means (1932), there arise potential conflicts of interest between corporate managers and dispersed shareholders when managers do not have an ownership interest in the firm. Jensen and Meckling (1976) formalize the relation between managerial equity ownership and the corporate value. They divide stockholders into inside shareholders who manage the firm and outside shareholders who do not. In spite that both classes of shareholders are entitled to the same dividends per share, the inside shareholders are able to augment their cash flows by additionally consuming non-marketable perquisites. Jensen and Meckling argue that inside management's interest better aligns with that of shareholders as the management equity ownership increases, resulting in convergence-of-interest hypothesis stating that "the greater the management share, the greater the firm value."

Fama and Jensen (1983) point out offsetting costs of significant management ownership. When a manager only owns a smaller stake, he is disciplined toward firm value maximization by the market forces. These forces come through the managerial labor market (Fama 1980), the product market (Hart 1983), and the corporate control market (Jensen and Ruback 1983; Stulz 1988). In contrast, when a manager controls a substantial fraction of the firm's equity, he can entrench himself from these market disciplines. With effective control, the manager may indulge in perquisite pursuit such as high salary and empire building. This entrenchment possibility predicts that corporate assets become less valuable when the management holds a significant portion of shares.

What Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990) try to accomplish, is to document how these two offsetting forces are realized in real firms using cross-sectional data. Theory alone cannot tell much about the specific relation between management ownership and firm's value. They say it is rather an empirical issue.

Morck *et al.* write on this point as follows:

"Theoretical arguments alone cannot unambiguously predict the relationship between management ownership and market valuation of the firm's assets. While the convergence-of-interest hypothesis suggests a uniformly positive relationship, the entrenchment hypothesis suggests that market valuation can be adversely affected for some range of high ownership stakes."

To illustrate, management can indulge in non-marketable perquisite consumption at the expense of outside shareholders. There are two countervailing forces in this regard. On one hand, as the management ownership increases, the management itself bears the greater portion of the cost of perquisite consumption, which will enhance self-discipline on perquisite consumption. On the other hand, as the management ownership increases, the management effectively protects him from market discipline on perquisite consumption, which will reduce external discipline on perquisite consumption. There exists a trade-off between self-discipline and external discipline as the management ownership changes. Theory alone cannot clearly tell us whether management's perquisite consumption increases or decreases as the management ownership changes. It is to be found empirically.

Management ownership level, though, is treated exogenous in Morck *et al.* Determination of an optimal level of management ownership is beyond their theory. Why does the management of some firms possess large ownership share, whereas the management of others does not? If there exists an optimal level of the management ownership most appropriate to maximize the perquisite consumption, why does the management not try to adjust the management ownership to the optimal one? Their theory does not address these questions.

Here comes Demsetz (1983). As mentioned earlier, he argues that the ownership structure of a firm is an endogenous outcome of competitive selection in which various cost advantages and disadvantages are balanced to arrive at an equilibrium organization of the firm. He writes as follows:

"One cannot simply assert that diffuse ownership fails to yield maximum profit or maximum value of the firm. A decision by shareholders to alter the ownership structure of their firm from concentrated to diffuse should be a decision made in awareness of its consequences for loosening control over professional management. The higher cost and reduced profit that would be associated with

this loosening in ownership control should be offset by lower capital acquisition cost or other profit-enhancing aspects of diffuse ownership if shareholders choose to broaden ownership."

According to Demsetz, there is no free lunch even in the case of perquisite pursuit. If there exists a possibility for management to indulge in excessive perquisite consumption at the cost of outside shareholders, rational investors would take into account this possibility and try to make management bear the full cost of expected perquisite consumption at the time they invest in the firm. The resulting outcome is desirable for neither the management nor the outside investors. Both management and outside investors would be better off if they find some mechanisms to reduce perquisite consumption. To Demsetz, increasing management ownership is a way of reducing this agency problem through the management's self commitment not to indulge in excessive perquisite consumption, and therefore it is not right to say that increase in management ownership causes higher agency cost through effective entrenchment.

Note that, in Demsetz's theory, the cost of increasing management ownership arises from a different source. To increase management ownership, the management should invest a larger portion of its wealth in the single firm he manages. This means that the management should take higher firm-specific risks and forgo benefits of diversification. To induce increased management ownership, the firm or the investors as a whole should compensate the management for bearing these higher risks, or for sacrificing diversification. This compensation will raise capital cost of the firm. Also, given the size of the management wealth, maintaining a high level of management ownership restricts the firm size and thus economies of scale in production. There exists a trade-off between agency cost on one side, and both capital and production costs on the other. Considering these trade-offs, shareholders as a whole (including the management) determine an optimal ownership structure including the management ownership. In Demsetz's firms, management ownership level is determined endogenously together with other factors affecting the firm performance, leading to lack of predictable relation between the management ownership and the firm value.

Demsetz (1995) recognizes that there might be one possible exception to this prediction on the unpredictable relation between ownership structure and firm's performance. Demsetz suggests that if the management indulges in amenity, the market value of the firm can be

depressed in equilibrium. Here, amenity is defined as the way firm's assets are used and the nature of the product the firm produces. Demsetz write as follows:

"An individual who owns a newspaper might derive utility from influencing the political tastes of readers. Catering to this preference may come at the expense of profit, for readers might not relish continued exposure to the owner's political philosophy in the news and editorializing given to them, and it certainly will alter the content of the newspaper as compared to one designed simply to maximize profit."

In this case, the management would rather continue amenity consumption even though he should fully pay for it in the form of low profit and low market valuation of his firm. This is more likely to be sustained in those firms where the incumbent management holds large enough shares to secure control over the firm from corporate control market. If this kind of amenity consumption is a dominant motive for the management to hold large, sometimes majority, shares, we expect to see low performance in those firms with large management ownership.

Other than the above amenity channel, we suggest another channel through which the management ownership might affect the firm value. Investors, *ex ante*, can ask full payment for the expected management perquisite consumption. Management may indulge in more perquisite consumption *ex post* than expected *ex ante* at the cost of outside shareholders. The occurrence of this event will lower firm's performance than implicitly contracted for. There exists a possible remedy for this. Takeover is that. Takeover can eliminate excessive *ex post* perquisite consumption. Thus, we expect to run into management indulging in excessive *ex post* perquisite consumption more frequently in firms where the management owns a large enough share and thus the takeover threats do not work. This conjecture leads to the empirical implication that there will be negative relation between management ownership and the firm performance.

III. Measures of firm performance

As a measure of firm's performance, Kim *et al.*, Morck *et al.* and McConnell *et al.* use Tobin's Q, whereas Demsetz and Lehn use profit rate. Does it matter whether one uses market value or profit rate as a measure of a firm's performance?

Firm's market value reflects future profitability of the firm as

well as current profit. On top of these, as market micro structure theory suggests, the market value might be affected by the extent of information asymmetry, frequency or volume of insider trading, and liquidity whereas profit stream is quite immune to these elements. As a result, the rate of return may differ across investors and securities being traded. For example, if there is a significant difference in liquidity between two equities, the less liquid equity should offer a higher return enough to offset reduction in liquidity to induce investors to buy the equity.

Regarding insider trading and its effects on the rate of return, Demsetz (1983) asks whether insider trading is a way of compensation to management for bearing a higher firm-specific risk, and whether investors take into account the possibility of exposure to insider trading when they trade equity of the firm. Demsetz and Lehn (1985) show that firms with high firm-specific risks tend to have more concentrated ownership structure. Demsetz (1986) reports that there exists a positive relation between the degree of insider trading and the firm-specific risk, and that there exists a negative relation between the degree of insider trading and the rate of return. Demsetz interprets this empirical result as a piece of indirect evidence supporting that insider trading is a way of compensation to controlling shareholders for taking a high firm-specific risk, and that investors discount stocks being actively traded by insiders.

If investors ask price discount for the equities insiders are intensively trading, and if insider trading is one way of compensation to management for bearing a higher firm-specific risk, then increasing management ownership will depress market price of equity of the firm in equilibrium. From this, we expect a negative relation between the management ownership and the firm's market value even when there is no significant relation between the management ownership and the firm's performance in terms of the profit rate. Thus, we expect to see that the relation between the firm value and the management ownership would be relatively more negative in the case of using market value as the dependent variable than in the case of using profit rate as the dependent variable.

IV. Hypotheses

In this paper, management is defined as officers and directors as

usual. We investigate the relation between the management ownership and the firm value after controlling for unobserved inter-firm differences as well as for the observed history of management ownership using panel data.

First, we consider the history of management ownership of a firm as an important factor that is potentially related with the firm's market value. More specifically, we test a hypothesis that firm's market value be negatively affected by the extent of management's insider trading. We also test another hypothesis that firm's market value be positively affected by an increase in management ownership, which is measured by the difference of management shareholding between the current year and the previous year.

Under asymmetric information between management and outsiders, both extent of management trading and recent change in management ownership affect the firm value. First, a firm experiencing intensive insider trading would incur higher implicit transaction cost to uninformed outsiders. This perception would lead outside investors to ask price discount when they buy such a firm's equity. Second, direction and amount of change in management shareholding between two consecutive years can be interpreted as existence of insider's private information about future profitability of the firm. When the management shareholding increases, it would have positive effect on the firm's value because uninformed outsiders would interpret it as the existence of high profit opportunity in the future.

V. Data and result

A. Data

In this analysis, price-earnings ratio is regressed against the measures of ownership, current and past, and other control variables. Tobin's Q has been used in many other studies including Morck *et al.* and McConnell *et al.*

In this paper, we decide not to use Tobin's Q as a measure of firm value. First, the process of computing it inevitably entails some arbitrariness. For example, it is hard to find objective criteria to compute replacement costs. Second, as Bagnani, Milonas, Saunders, and Travlos (1994) point out, market price of risky debt may also be affected by management ownership. If this is the case, we should use

market price of debt when we use Tobin's Q as a measure of firm's market value, which was not the case in previous studies. Further, if we use market prices of debt to take into account this point, Tobin's Q would not anymore be an appropriate measure of firm value from *shareholders' perspective*; rather it is a measure of firm value from a *general claim holder's perspective*.

Price-earnings ratio does not face those problems that Tobin's Q does. It does not require any arbitrary computing process. In price-earnings ratio, earnings can be considered as a measure of opportunity cost of shareholders' capital, and price of equity is the right measure of firm's market value from shareholders' perspectives. In this paper, we use price-earnings ratio as a measure of firm value.

To control for industry effect, this paper only uses data on 11 firms in the same chemical industry. For each sample firm, we have annual data from 1981 through 1990, resulting in 110 (firm, year) combinations. As the data source, we use the *Value Line Investment Survey* which is being widely used in related works.

B. Estimation Results

We report three sets of estimation results: pooled least squares, fixed effects, and random effects models. The pooled least squares treat time-series data of a firm just as different firms at a point in time. This method does not utilize information on who's who regarding firm identity. The reason why we still report the pooled least squares results is that it is similar to the cross sectional regression in that it does not control for unidentified inter-firm differences. Table 1 shows the results from the pooled least squares, which serve as a benchmark for interpreting the panel estimation results in Table 2.

In Table 1, when we initially run regression of price-earnings ratio on management ownership share, we obtain a negative relation between management shareholding and price-earnings ratio. When we introduce an ownership history variable, whether the variance of management shareholding or the change in it, the history variable turns out significant with sign as expected, whereas the current management shareholding itself loses statistical significance. Column 5 shows that the coefficient of the variance of management shareholding is negative and statistically significant at 1% significance level, whereas the coefficient of the current level of management shareholding is

TABLE 1
RESULTS FROM THE POOLED LEAST SQUARES

Pooled least squares regression of price-earnings ratio on equity ownership, variance of management shareholding, change in management shareholding, dividend per share, debt ratio, expected growth rate of earnings per share, and variance of earnings per share.

	(1)	(2)	(3)	(4)	(5)	(6)
intercept	15.42** (44.92)	15.44** (37.03)	15.14** (36.20)	15.67** (32.84)	14.78** (17.84)	15.80** (18.31)
insider	-0.06** (-5.27)	-0.68 (-1.34)			0.01 (0.27)	-0.03 (-1.20)
insider^2		0.00 (0.15)	-			
insider+block			-0.04* (-2.22)	-0.15** (-2.79)	-	
(insider+block)^2				0.003* (2.41)	-	
var(insider)					-0.04** (-3.45)	
change(insider)						0.13** (2.92)
dividend					3.03** (3.43)	1.00 (1.48)
debt					-3.86** (-2.67)	-5.43** (-3.46)
r_E/S					3.19** (4.05)	2.70** (3.22)
var(E/S)					-2.15** (-3.08)	-0.95 (-1.55)

1. Within parentheses are t-values.
2. Variables are defined as follows.
   (a) insider: fraction of management share (%)
   (b) insider+block: sum of management share and outside block holder share (%)
   (c) var(insider): over time variance of the inside management share within a firm
   (d) change(insider): change in the inside management share between the current and the previous years
   (e) dividend: dividend per share
   (f) debt: debt ratio
   (g) r_E/S: expected growth rate of earnings (E) per share (S)
   (h) var(E/S): over time variance of earnings per share within a firm
3. **, *, and # denote statistical significance at 1%, 5%, 10% level, respectively.

insignificant even at 10% level. Column 6 shows that the coefficient of the recent change in management ownership is positive and statistically significant at 1% level, whereas the level of current management ownership is insignificant even at 10% level.

Note that high debt ratio and volatility in earnings per share have negative effects on the firm value, whereas high dividend payment and high expected growth of earnings have positive ones.

In Table 2, we report the estimation results from panel fixed effects and panel random effects models. There are trade-offs between the two panel data models. The fixed effects model better controls for unobserved inter-firm differences and better addresses the potential endogeneity problem of the management ownership variable, whereas the random effect model is more parsimonious in terms of the parameters being estimated. The fixed effects model loses as many degrees of freedom as the number of sample firms, whereas the random effects model does not address the potential endogeneity of the management ownership variable and only partially controls for the unobserved inter-firm differences.

The results in Table 2 again suggest that history of management ownership matters, and that once the variance of or change in management ownership is controlled for the current management shareholding itself does not have any significant effect on the firm value. Most results in Table 2 agree with the corresponding results in Table 1. As expected, though, statistical significance drops in Table 2, particularly so in the case of fixed effect results.

Even with limited data, it is suggestive that the history, not the current state, of management shareholding, be crucial in determining firm value. Regarding the effect of ownership history, we observed the following two facts. First, market participants ask a discount when they trade equities of a firm of which the management is actively involved in trading. Second, market participants are willing to pay premium to buy equities of a firm of which the management recently increases its shareholding.

TABLE 2

RESULTS FROM PANEL FIXED EFFECTS AND PANEL RANDOM EFFECTS MODELS

Regression of price-earnings ratio on equity ownership, variance of management shareholding, change in management shareholding, dividend per share, debt ratio, expected growth rate of earnings per share, and variance of earnings per share.

	fixed effects model		random effects model	
	(1)	(2)	(3)	(4)
intercept	-	-	14.86** (13.01)	16.69** (16.62)
insider	-0.09 (-1.61)	-0.13* (-2.33)	0.00 (0.07)	-0.03 (-1.09)
var(insider)	-0.17 (-0.00)		-0.06** (-3.01)	
change(insider)		0.13* (2.17)		0.18* (2.21)
dividend	1.40 (1.69)	0.18 (0.12)	3.23** (2.80)	0.78 (0.87)
debt	-0.26 (-0.15)	-0.45 (-0.27)	-4.07* (-2.07)	-8.47 ** (-4.74)
r_E/S	3.55 ** (4.85)	3.56** (4.84)	3.73** (4.43)	3.31** (3.51)
var(E/S)	15.37 (0.00)	13.04 (0.00)	-2.08# (-1.81)	-1.1 (-1.25)

1. Within parentheses are t-values.
2. Variables are defined as follows.
   (a) insider: fraction of management share (%)
   (b) insider+block: sum of management share and outside block holder share (%)
   (c) var(insider): over time variance of the inside management share within a firm
   (d) change(insider): change in the inside management share between the current and the previous years
   (e) dividend: dividend per share
   (f) debt: debt ratio
   (g) r_E/S: expected growth rate of earnings (E) per share (S)
   (h) var(E/S): over time variance of earnings per share within a firm
3. **, *, and # denote statistical significance at 1%, 5%, 10% level, respectively.

VI. Concluding remarks

This paper revisits the issue of analyzing the relation between the insider ownership share and the firm value. Under information asymmetry between the inside management and the outside investors, history of the management ownership affects firm value in the following two ways. First, an active insider trading poses the possibility of outsider exploitation by the inside management, depressing the firm value. Second, insider's buying of shares signals positive news on the firm's value in a credible way, increasing the firm value.

This paper, by using panel data of firms selected from a single industry, shows that the management ownership history indeed matters in determining the firm value as predicted by the information asymmetry arguments. This paper also shows that once the management ownership history is controlled, the current level of the management ownership is no longer statistically significant, which is consistent with Demsetz's (1983) arguments.

In this paper, we sacrifice the sample size to better control for industry effects by focusing on a single chemical industry. We think, though, that the sample size is rather small. We do not want to over-sell the empirical results obtained in this paper. We just would like to point out that our hypotheses deserve further empirical investigation. More specifically, testing the hypotheses presented in this paper using data from other periods and/or other industries would be interesting.

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