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Additional evidence on equity ownership and corporate value*

John J. McConnell
Purdue University, West Lafayette, IN 47907, USA

Henri Servaes
University of Chicago, Chicago, IL 60637, USA

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We investigate the relation between Tobin's Q and the structure of equity ownership for a sample of 1,173 firms for 1976 and 1,093 firms for 1986. We find a significant curvilinear relation between Q and the fraction of common stock owned by corporate insiders. The curve slopes upward until insider ownership reaches approximately 40% to 50% and then slopes slightly downward. We also find a significant positive relation between Q and the fraction of shares owned by institutional investors. The results are consistent with the hypothesis that corporate value is a function of the structure of equity ownership.

1. Introduction

Traditionally, finance theory has not distinguished among the owners of shares of stock. The generally, though not universally, accepted view was that the stockholders of an individual firm could be characterized as a widely dispersed and homogeneous group of relatively uninvolved absentee owners. To the extent that shareholders exercised any influence over the firm's activities, they voted with their feet. By extension, it was presumed that managers are led to act in shareholders' best interest by signals received from the capital market [Easterbrook (1984), Rozeff (1984)], by forces operating in the managerial labor market [Fama (1980)], and, in the extreme, by the threat

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of an outside takeover [Manne (1965), Martin and McConnell (1990)]. However, this perspective has not been without challengers who argue that shareholders are not indistinguishable and that the firm's performance depends on the distribution of share ownership among managers and others. The origins of this challenge are often traced to Berle and Means (1932). Jensen and Meckling (1976) show formally how the allocation of shares among insiders and outsiders can influence the value of the firm.

Following Jensen and Meckling, interest in the relation between corporate value and the allocation of shares among managers and nonmanagers has continued to evolve on both the theoretical and the empirical front. Stulz (1988) develops a model in which the market value of the firm first increases, then decreases, as equity ownership is concentrated in the hands of insiders. Morck, Shleifer, and Vishny (1988) also advance an argument which suggests that the relation between value and inside equity ownership is nonlinear. Demsetz and Lehn (1985), Morck, Shleifer, and Vishny (1988), Holderness and Sheehan (1988), and Hermalin and Weisbach (1987) present evidence on the relation between corporate performance and the ownership structure of common stock.

In this paper, we provide further evidence on the relation between the distribution of equity ownership and corporate value. Specifically, we investigate the cross-sectional relation between Tobin's Q and equity ownership for a sample of 1,173 firms in 1976 and for a sample of 1,093 firms in 1986. All firms are listed on either the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX). For both samples, we find a significant curvilinear relation between Q and the fraction of shares owned by corporate insiders. Q first increases, then decreases, as share ownership becomes concentrated in the hands of managers and members of the board of directors; however, the downward slope beyond the inflection point of the curve is not steep. We also find a significant positive relation between Q and the proportion of shares held by institutional investors. Contrarily, we find no significant correlation between Q and the presence of a block stockholder or the fraction of equity owned by blockholders.

The following section discusses in more detail related theoretical and empirical work. Section 3 describes the data and presents the primary results, while Section 4 conducts some additional tests of the results' robustness. Section 5 concludes.

2. Ownership structure and corporate value

2.1. Insider ownership

Berle and Means (1932) point out the potential conflict of interest between corporate managers and dispersed shareholders when managers do not have an ownership interest in the firm. Various aspects of this problem have been

emphasized by Baumol (1959), Marris (1964), Williamson (1964), and Jensen (1986), among others. Jensen and Meckling (1976) formalize the relation between corporate value and managerial equity ownership. They divide stockholders into two groups – an inside shareholder who manages the firm and has exclusive voting rights and outside shareholders who have no voting rights. Both classes of securityholders are entitled to the same dividends per share of stock held. However, the inside shareholder is able to augment this stream of cash flows by consuming additional nonmarketable perquisites. In this framework, there is an incentive for the manager to adopt investment and financing policies that benefit him, but reduce the payoff to outside stockholders. Thus, the value of the firm depends on the fraction of shares owned by insiders. The greater the proportion of the shares owned by insiders, the greater the value of the firm.

Stulz (1988) focuses on the importance of the takeover market for disciplining corporate managers. In his model, the premium that a hostile bidder must pay to gain control of a target firm increases as the fraction of equity owned by managers increases, but the probability that the takeover will succeed decreases. When insiders own a small fraction of the shares outstanding, it is more likely that a hostile takeover will succeed at a premium that is less than the maximum the bidder is willing to pay. As managerial equity ownership increases, the probability of a successful hostile takeover, for any given premium, declines. At 50% managerial ownership, the probability of a hostile takeover is zero. This reasoning gives rise to a curvilinear relation between the value of the firm and the fraction of shares owned by insiders. In this relation, the value of the firm first increases, then decreases, as managerial equity ownership increases. Further, the firm's value reaches a minimum when insider ownership reaches 50%.

Morck, Shleifer, and Vishny (1988) suggest that managers respond to two opposing forces and that the relation between ownership and value depends on which force dominates over any particular range of managerial equity ownership. The opposing forces work in the following way. Managers' natural tendency is to allocate the firm's resources in their own best interests, which may conflict with the interests of outside shareholders. As management's equity ownership increases, however, their interests are likely to coincide more closely with those of outside shareholders. The first of these forces has a negative effect on the value of the firm, whereas, the second has a positive effect. Morck et al. point out that it is not possible, a priori, to predict which force will dominate at any level of managerial equity ownership. Thus, the relation between corporate value and ownership structure is an empirical issue.

In contrast, Demsetz (1983, p. 384) argues that the ownership structure of the firm that 'emerges 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'. Accordingly, Demsetz concludes that

there is no relation between ownership structure and profitability. Demsetz and Lehn (1985) present evidence consistent with Demsetz' conclusions. They regress the accounting profit rate of 511 U.S. companies in 1980 on different measures of ownership concentration and find no significant correlation. Evidence to the contrary is presented by Morck, Shleifer, and Vishny (1988) and Hermalin and Weisbach (1987). Morck et al. 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 insiders. Using a sample of 371 *Fortune* 500 firms for 1980, the authors find that Q first rises as insider ownership increases up to 5%, then falls as ownership increases to 25%, then rises slightly at higher ownership levels. Hermalin and Weisbach (1987) estimate similar regressions for 134 NYSE firms for 1971, 1974, 1977, 1980, and 1983. Their research reveals a non-monotonic relation between Q and the fraction of stock owned by all present and former CEO's still on the board of directors. However, their results are different from those of Morck et al. They find that the relation between Q and CEO stock ownership is positive between 0% and 1%, negative between 1% and 5%, positive between 5% and 20%, and negative after that.

2.2. Blockholders and institutional investors

A related set of literature has focused on the pressure that equity blockholders and institutional investors can exert to force the firm toward value maximization, regardless of managers' ownership position. Shleifer and Vishny (1986) present a model in which takeovers can be successful only when the bidder has already acquired a large minority ownership position in the firm. The potential takeover threat that large blockholders can exert works as an effective device for monitoring management. Whereas small atomistic shareholders cannot benefit from costly monitoring, holders of large blocks can, because they are able to capture a large fraction of the wealth gains that result from a takeover. Thus, Shleifer and Vishny predict that, all else being equal, the presence of a large-block equityholder will have a positive effect on the market value of the firm.

Consistent with Shleifer and Vishny's argument, Mikkelson and Ruback (1985), Holderness and Sheehan (1985), and Barclay and Holderness (1990) report positive excess returns around the announcement date when outsiders acquire large equity positions. All three studies report, however, that these gains are largely dissipated if a takeover or other corporate restructuring, including management turnover, does not soon follow the large share acquisition. Additionally, Holderness and Sheehan (1988) analyze a sample of firms in which a single shareholder owns 50% or more of the company's outstanding common stock. They compare the Q ratios and accounting profit rates of this sample with those of a matching sample of firms in which no single

shareholder owns more than 20% of the stock. They find no significant difference between the two samples for either measure of performance.

The relation between corporate value and institutional ownership is as yet relatively unexplored terrain. Pound (1988) considers the incentives confronted by institutional investors. He proposes three hypotheses of the relation between institutional ownership and corporate value: (i) the efficient-monitoring hypothesis, (ii) the conflict-of-interest hypothesis, and (iii) the strategic-alignment hypothesis. According to the efficient-monitoring hypothesis, institutional investors have greater expertise and can monitor management at lower cost than can small atomistic shareholders. Thus, this hypothesis predicts a positive relation between institutional ownership and corporate value. According to the conflict-of-interest hypothesis, because of other profitable business relationships with the firm, institutional investors are coerced into voting their shares with management. The strategic-alignment hypothesis suggests that institutional investors and managers find it mutually advantageous to cooperate. This cooperation reduces the beneficial effects on firm value that could result from monitoring by institutional investors. Thus, the conflict-of-interest and the strategic-alignment hypotheses both predict a negative relation between institutional ownership and the value of the firm.

Brickley, Lease, and Smith (1988) and Pound (1988) provide empirical evidence on the role of institutional investors in monitoring corporate managers. Brickley et al. present evidence indicating that institutional investors vote more actively on antitakeover amendments than do other shareholders. Additionally, institutions more actively oppose proposals that appear to be harmful to shareholders. Pound (1988) investigates proxy contests and finds that the probability that management will prevail increases with the fraction of shares owned by institutional investors. Thus, the few studies that do exist appear to provide contradictory evidence on the effect of institutional investors on the firm's activities.

3. The evidence

3.1. Data

The primary hypothesis investigated here is that the value of the firm is a function of the distribution of equity ownership among corporate insiders (i.e., officers and directors), individual atomistic shareholders, block shareholders, and institutional investors. In the analysis, Tobin's Q ratio is regressed against various measures of ownership (and other control variables) to gauge their impact on the value of the firm. The analysis is conducted separately with two samples of firms, one for 1976 and the other for 1986. The 1987 Compustat tapes are used to compute Tobin's Q ratios and the

1976 and 1986 editions of the *Value Line Investment Survey* are used to gather data on the distribution of equity ownership. Q ratios are calculated as the market value of common stock plus the estimated market value of debt and preferred stock divided by the replacement value of assets.[1] Financial firms are omitted from the analysis. Also, nonfinancial firms with Q ratios greater than 6.0 are deleted to obviate problems with outliers. This screen results in a loss of two firms in 1976 and nine firms in 1986.

We are interested in share ownership by corporate insiders, equity blockholders, and institutional investors. The 1976 and 1986 issues of the *Value Line Investment Survey* report the fraction of shares owned by corporate insiders and blockholders. These are our measures of inside ownership and block ownership. *Value Line* gathers this information from annual corporate proxy statements, public disclosures, and Forms 3 and 4 filed with the Securities and Exchange Commission (SEC) on insider trading. *Value Line* defines corporate insiders to include officers and members of the board of directors. *Value Line's* definition of a blockholder contains some ambiguity. This category includes all stockholders who own 5% or more of the outstanding stock, but also includes some investors who own less than 5%.[2] The *Value Line* information on institutional ownership also contains some ambiguity. The 1976 issue reports the number of shares owned by 'investment companies', whereas the 1986 issue reports the number of shares owned by 'institutional investors'. We use these numbers as our measure of institutional ownership. Our 1976 sample includes 1,173 firms and the 1986 sample includes 1,093 firms.

For 1976, average inside ownership is 13.9% (median = 6%) and ranges from 0% to 90%. For 1986, average inside ownership is 11.84% (median = 5%) and ranges from 0% to 89%. For 1976, 113 firms have at least one blockholder and the average ownership of all blockholders in these firms is 32.4%. In 1986, we have 281 firms with at least one blockholder and the

[1]A variation of the Lindenberg and Ross (1981) algorithm is used to compute the market value of the firm (debt plus equity) and the replacement value of its assets. A description of the procedure to compute these values is available from the authors.

[2]Because *Value Line* updates share ownership to reflect trades reported to the SEC by insiders, Song and Walkling (1989) note that the *Value Line* data have the potential to be more timely than ownership information contained in proxy statements. To validate the *Value Line* data, we selected the first 100 firms in alphabetical order from 1986 and all firms with insider ownership exceeding 45% and cross-checked them with 1986 and 1987 proxies. In about 75% of the cases, the *Value Line* data and the 1986 proxy data were within 3% of each other. In the remaining cases, about 50% of the time *Value Line* appeared to be more timely than the 1986 proxy. In the other 50%, it was not possible to determine which source provided information that more accurately identified year-end 1986 holdings by insiders. As a further check, for those observations with inside ownership exceeding 45% for which we could not reconcile the difference between proxy and *Value Line* in *Value Line's* favor, we substituted proxy data and reestimated our regressions (which we report later). The coefficients were unchanged up to at least two decimals and their significance levels were also unchanged.

average ownership is 25.6% for all blockholders in these firms. Average institutional ownership is 4.65% in 1976 and 37.6% in 1986.[3]

3.2. Empirical results

Table 1 presents the initial regression results. Column (1) contains the basic model, in which Q is regressed against insider ownership ($INOWN$) and insider ownership squared ($INOWN^2$). For both 1976 and 1986, there is strong evidence of a curvilinear relation between insider ownership of equity and Q – value first increases, then decreases, as ownership is concentrated in the hands of officers and directors. Fig. 1 contains a graph of these equations. At low levels of inside ownership, the positive effect of inside ownership strongly dominates any negative effect. For 1976, at low levels of inside ownership, the relation between Q and inside ownership is approximately one-for-one – a 10% increase in inside ownership increases Q by approximately 10%. For 1986, at low levels of inside ownership, the relation is approximately three-for-one – a 10% increase in inside ownership increases Q by approximately 30%.

This curvilinear relation is consistent with Stulz (1988). Also consistent with Stulz, this curve reaches its maximum prior to 50% inside ownership. In 1976, the maximum is reached when insider ownership is 49.4%. In 1986, the maximum is reached at 37.6% insider ownership. Additionally, in Stulz's model, the curve reaches its minimum when managers own 50% of the firm's equity. Thus, the value of the firm is less when insiders own 50% of the equity than when they own 0%. This prediction is not borne out with our regressions. For example, for both 1976 and 1986, at 75% inside ownership, the value of the firm is still greater than at 0% insider ownership.

In regressions (2), (3), and (4) of table 1, various measures of blockholder ownership are introduced into the model as additional independent variables. In (2) the measure is the percentage of shares owned by the largest single blockholder ($LB1$), in (3) the measure is the percentage of shares owned by all blockholders ($LB2$), and in (4) the measure is an indicator variable that is assigned the value of one if the firm has a blockholder and zero otherwise ($LB3$). In no case, for either year, does the measure of blockholder ownership enter the regression at even the 20% level of significance. Thus, the results are not consistent with the hypothesis that blockholders have an independent effect on corporate value. It is worth noting that the *Value Line* identification scheme does not distinguish among different types of block-

[3]Several telephone conversations with *Value Line* suggest three possible explanations for the large disparity in institutional holdings between 1976 and 1986: (i) the reporting procedure improved between 1976 and 1986, (ii) institutional ownership increased over this period, and (iii) the classification of 'investment company' includes only mutual funds, whereas the 'institutional investor' category includes all types of institutional investors.

Table 1

Regression analysis of Q on equity ownership for 1,173 NYSE or AMEX firms in 1976 and 1,093 firms in 1986 (p-values in parentheses below coefficients).

Variable[a]	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			(A) 1976 sample (sample size = 1,173)				
Intercept	0.9302	0.9216	0.9218	0.9213	0.9149	0.8152	0.7850
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
INOWN	1.2145	1.2626	1.2616	1.2563		1.1025	
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	
$INOWN^2$	−1.2304	−1.2866	−1.2854	−1.2773		−0.9056	
	(0.01)	(0.01)	(0.01)	(0.01)		(0.05)	
LB1		0.1544					
		(0.35)					
LB2			0.1454				
			(0.36)				
LB3				0.0557			
				(0.37)			
INSTO						2.4612	2.5779
						(0.00)	(0.00)
INO + LB2						1.3000	1.2600
						(0.00)	(0.00)
$(INO + LB2)^2$						−1.4980	−1.2425
						(0.00)	(0.00)
Inflection point[b]	49.4%	49.1%	49.1%	49.1%	43.4%	60.9%	50.7%
Adjusted R^2	2.7%	2.7%	2.7%	2.7%	2.6%	6.6%	6.8%
			(B) 1986 sample (sample size = 1,093)				
Intercept	1.2413	1.2475	1.2520	1.2582	1.2848	0.9228	0.9209
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
INOWN	3.0644	3.0476	3.0360	3.0486		2.9348	
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	
$INOWN^2$	−4.0740	−4.0623	−4.0554	−4.0840		−3.4020	
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	
LB1		−0.0769		(0.66)			
		(0.66)					
LB2			−0.1220				
			(0.46)				
LB3				−0.0571			
				(0.31)			
INSTO						0.8215	0.8688
						(0.00)	(0.00)
INO + LB2					1.7655		1.9199
					(0.00)		(0.00)
$(INO + LB2)^2$					−2.1840		−2.0650
					(0.00)		(0.00)

Table 1 (continued)

Variable[a]	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Inflection point[b]	37.6%	37.5%	37.4%	37.3%	40.4%	43.2%	46.5%
Adjusted R^2	6.0%	5.9%	5.9%	6.0%	2.6%	9.3%	6.2%

[a] *INOWN* = stock ownership by insiders,
Q = market value of the firm divided by the replacement value of the assets,
RV = replacement value of assets (estimated),
INSTO = institutional ownership as reported by Value Line,
LB1 = ownership by the largest outside blockholder as reported by Value Line,
LB2 = sum of the ownership of all large outside blockholders as reported by Value Line,
LB3 = an indicator variable equal to 1 if a blockholder exist, 0 otherwise,
INO + *LB2* = *INOWN* + *LB2*.

[b] The inflection point is the percentage ownership of equity at which the value of Q reaches its maximum in the estimated regressions.

holders. For example, a blockholder who is a descendent of the corporate founder may hold the shares purely as a passive investment, taking little interest in corporate activities. As a consequence, these passive blockholders might most appropriately be considered insiders. For this reason, blockholders are combined with insiders [$(INO + LB2)$ and $(INO + LB2)^2$] and the regression is reestimated in (5).

For both 1976 and 1986, the coefficient of $(INO + LB2)$ is positive and significant and the coefficient of $(INO + LB2)^2$ is negative and significant. Thus, at this level of aggregation, our results are not inconsistent with the conjecture that large blockholders and inside owners operate in conjunction with each other to influence corporate value. The adjusted R-squared is lower in both regressions, however, than in the regressions that include only inside ownership and inside ownership squared.

In regression (6), institutional ownership (*INSTO*) is inserted as an independent variable along with *INOWN* and $INOWN^2$. The coefficient of institutional ownership is positive and significant in both samples. Also, in both cases, the inclusion of institutional ownership increases the inflection point of the relation between inside ownership and corporate value. For 1976 the inflection point is 60.9% (up from 49.4%) and for 1986 it is 43.2% (up from 37.6%). The final regression in table 1 includes institutional ownership along with $(INO + LB2)$ and $(INO + LB2)^2$. Again, for both 1976 and 1986 the coefficient of inside ownership plus block ownership is positive and significant and the coefficient of the square of this term is negative and significant. And, again, for both years the coefficient of institutional ownership is positive and significant.

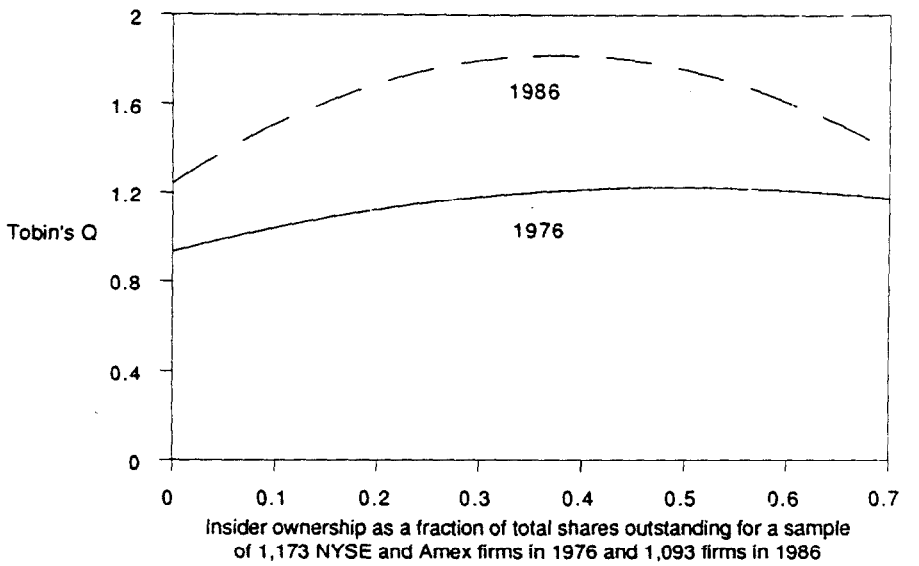

Fig. 1. Tobin's Q as a function of insider ownership.

To this point, the results are consistent with the hypothesis that the ownership structure of equity has an important influence on corporate value. They are consistent with the general prediction by Morck et al. of a nonlinear relation between corporate value and the fraction of shares controlled by corporate insiders. They are also consistent with the more specific prediction by Stulz (1988) of a curvilinear relation between the fraction of shares controlled by corporate insiders and corporate value and with the efficient-monitoring hypothesis of Pound (1988), which predicts a positive relation between corporate performance and the fraction of shares held by institutional investors. In addition, because the inclusion of institutional ownership increases the inflection point of the curve, the results appear to suggest that institutional ownership reinforces the positive effect of insider ownership on corporate value.

The evidence on the role of block ownership is more ambiguous. On the one hand, none of our measures of block ownership independently enter the regressions significantly. These results are consistent with the evidence of Holderness and Sheehan (1988), who do not find a significant relation between corporate performance and the presence of a single dominant shareholder. Our results also can be viewed as consistent with Mikkelson and Ruback (1985) and Barclay and Holderness (1990), who report a positive stock-price reaction when an investor initially obtains block ownership, but

who also report that unless the blockholder initiates some action to change corporate control – by means of either a takeover or a change in management – the initial gains are soon dissipated. If most blockholders take a passive attitude toward management, a failure to find a cross-sectional relation between corporate value and block ownership is compatible with the Mikkelson–Ruback and Barclay–Holderness results. On the other hand, when block ownership is combined with ownership by officers and directors, the coefficients are significant. This result hints that the effects of block ownership and inside equity ownership may interact in an as-yet undetermined way.

We now introduce additional independent variables into the regressions to determine whether our results are sensitive to the inclusion of other factors that have been advanced as important determinants of Tobin's Q. This analysis addresses the concern that the significant correlation between Q and ownership structure is a spurious result of a correlation between these two variables and a third omitted variable. The control variables include financial leverage, research and development intensity, advertising intensity, and the replacement value of assets.

Financial leverage is measured as the market value of debt divided by the replacement value of assets ($DEBT/RV$). Research and development intensity is measured as research and development expenditures for the year divided by the replacement value of assets ($R\&D/RV$). Advertising intensity is measured as advertising expenditures divided by the replacement value of assets (ADV/RV). Research and development and advertising expenditures for 1976 and 1986 are taken from the Compustat tapes.

The regressions including the control variables are reported in table 2. There are two sets of regressions for 1976 and two for 1986. One set includes the control variables along with $INOWN$, $INOWN^2$, and $INSTO$. The other includes the control variables along with $INO + LB2$, $(INO + LB2)^2$, and $INSTO$. The curvilinear relation between value and inside equity ownership is still evident; the inflection points of the curves are relatively unchanged from the corresponding regressions in table 1; and the coefficient of institutional ownership remains positive and highly significant.

With the exception of replacement value in 1976, each of the control variables enters the regression significantly. The coefficients of $DEBT/RV$, $R\&D/RV$, and ADV/RV are positive and the coefficient of RV is negative. The coefficients of $R\&D/RV$ and ADV/RV are consistent with the conjecture that both variables reflect expenditures that increase the value of the firm's intangible assets. The positive coefficient on the debt variable is consistent with a tax argument [Modigliani and Miller (1963)], a leverage-signaling argument [Ross (1977)], and a free-cash-flow argument [Jensen (1986)].

The inclusion of replacement value controls for the possibility that Q and ownership are related through the size of the firm. It may be easier for

Table 2

Regression analysis of Q on equity ownership, debt, research and development, advertising expenditures, and replacement value of assets for 1,173 NYSE and AMEX firms in 1976 and 1,093 firms in 1986 (p-values in parentheses below coefficients).

	1976 sample (sample size = 1,173)		1986 sample (sample size = 1,093)	
Variable[a]	(1)	(2)	(3)	(4)
Intercept	0.6136 (0.00)	0.5853 (0.00)	0.8733 (0.00)	0.9106 (0.00)
INOWN	0.8433 (0.00)		2.2917 (0.00)	
$INOWN^2$	−0.6111 (−0.17)		−2.7406 (0.00)	
INO + LB2		1.0392 (0.00)		1.2954 (0.00)
(*INO + LB2*)		−1.0249 (0.01)		−1.5096 (0.00)
INSTO	2.1750 (0.00)	2.2691 (0.00)	0.6857 (0.00)	1.6963 (0.00)
DEBT/RV	0.6248 (0.00)	0.6271 (0.00)	0.2562 (0.03)	0.2697 (0.02)
R&D/RV	7.01 (0.00)	6.91 (0.00)	3.72 (0.00)	3.71 (0.00)
ADV/RV	2.69 (0.00)	2.73 (0.00)	2.85 (0.00)	3.03 (0.00)
RV	−0.00001 (0.08)	−0.00001 (0.11)	−0.00002 (0.00)	−0.00002 (0.00)
Inflection point[b]	69.0%	50.7%	41.8%	42.9%
Adjusted R^2	18.3%	18.4%	15.3%	13.1%

[a]*INOWN* = stock ownership by insiders,
Q = market value of the firm divided by the replacement value of the assets,
RV = replacement value of assets (estimated),
INSTO = institutional ownership as reported by Value Line,
LB1 = ownership of the largest outside blockholder as reported by Value Line,
LB2 = sum of the ownership of all large outside blockholders as reported by Value Line,
LB3 = an indicator variable equal to 1 if a blockholder exist, 0 otherwise,
INO + LB2 = *INOWN + LB2*,
DEBT/RV = market value of debt divided by the replacement value of assets,
R&D/RV = research and development expenditures for the year divided by the replacement value of assets,
AD/RV = advertising expenditures for the year divided by the replacement value of assets.

[b]The inflection point is the percentage ownership of equity at which the value of Q reaches its maximum in the estimated regressions.

insiders to own a large fraction of a smaller firm, and size and Q may be inversely correlated. The negative coefficient on the replacement value of assets in the regressions of table 2 is consistent with the argument that firm size and Q are inversely correlated, but even after this effect is controlled for, the relation between Q and ownership structure is significant. Thus, including various control variables does not change our conclusions about the relation between corporate value and the distribution of equity ownership among corporate officers and directors, institutional investors, individual atomistic investors, and large-block stockholders.

As we noted, our results are consistent with the general prediction by Morck et al. of a nonlinear relation between corporate value and insider equity ownership. However Morck et al. also report a specific empirical form for this relation. In an effort to replicate their results, we estimate a piece-wise linear regression in which we separate ownership into three categories, as do they. Specifically, the ownership measures are:

INOWN, 0 to 5 = inside ownership if insider ownership $< 5\%$,
= 5% if insider ownership $\geq 5\%$;

INOWN, 5 to 25 = 0 if insider ownership $< 5\%$,
= insider ownership -5% if $5\% <$ insider ownership $<$ 25%,
= 20% if insider ownership $\geq 25\%$;

INOWN, 25 to 100 = 0 if insider ownership $< 25\%$,
= insider ownership -25% if insider ownership $\geq 25\%$.

We define similar variables for the sum of inside ownership and ownership by blockholders (i.e., *INO* + *LB2*). In addition to the ownership variables, all the control variables are included in the regressions, along with institutional ownership. The results of this set of regressions are reported in table 3. For both 1976 and 1986, the coefficients for both specifications of inside ownership are significant and positive for ownership between 0% and 5%. This result is consistent with Morck et al. The coefficients of the ownership variables for inside ownership between 5% and 25% and between 25% and 100%, however, are not consistent with their findings. The coefficient of insider ownership between 5% and 25% is positive (albeit typically not significant) for both samples and for both specifications of inside ownership. Above 25% insider ownership, the slope of the regressions is essentially not different from zero.

One major difference between our study and Morck et al. is that their sample includes only large firms. To investigate the possibility that the differences in firm size explain the difference between our results and theirs,

Table 3

Piecewise linear regression analysis of Q on equity ownership, debt, research and development, advertising expenditures, and replacement value of assets for 1,173 NYSE and AMEX firms in 1976 and 1,093 firms in 1986 (p-values are in parentheses below the coefficients).

	1976 sample (sample size = 1,173)		1986 sample (sample size = 1,093)	
Variable[a]	(1)	(2)	(3)	(4)
Intercept	0.5920 (0.00)	0.5539 (0.00)	0.8378 (0.00)	0.8100 (0.00)
INOWN, 0 to 5	2.1476 (0.06)		4.8861 (0.00)	
INOWN, 5 to 25	0.4005 (0.22)		1.2077 (0.01)	
INOWN, 25 to 100	0.3512 (0.11)		−0.1401 (0.72)	
(*INO* + *LB2*), 0 to 5		2.7841 (0.00)		7.1909 (0.00)
(*INO* + *LB2*), 5 to 25		0.4304 (0.18)		0.0658 (0.88)
(*INO* + *LB2*), 25 to 100		0.1691 (0.37)		−0.1446 (0.57)
INSTO	2.1449 (0.00)	2.2386 (0.00)	0.6392 (0.00)	0.6021 (0.00)
DEBT/RV	0.6232 (0.00)	0.6242 (0.00)	0.2569 (0.00)	0.2562 (0.03)
R&D/RV	6.95 (0.00)	6.78 (0.00)	3.62 (0.00)	3.52 (0.00)
ADV/RV	2.71 (0.00)	2.76 (0.00)	2.88 (0.00)	3.08 (0.00)
RV	−0.00001 (0.12)	−0.000008 (0.19)	−0.000014 (0.00)	−0.000015 (0.00)
Adjusted R^2	18.3%	18.4%	15.6%	14.1%

[a]*INOWN*, 0 to 5 = inside ownership if insider ownership < 5%,
= 5% if insider ownership ≥ 5%;

INOWN, 5 to 25 = 0 if insider ownership < 5%,
= insider ownership − 5% if 5% < insider ownership < 25%,
= 20% if insider ownership ≥ 25%;

INOWN, 25 to 100 = 0 if insider ownership < 25%,
= insider ownership − 25% if insider ownership ≥ 25%;

(*INO* + *LB2*), 0 to 5 = (*INO* + *LB2*) if (*INO* + *LB2*) < 5%,
= 5% if (*INO* + *LB2*) ≥ 5%;

(*INO* + *LB2*), 5 to 25 = 0 if (*INO* + *LB2*) < 5%,
= (*INO* + *LB2*) − 5% if 5% < (*INO* + *LB2*) < 25%,
= 20% if (*INO* + *LB2*) ≥ 25%;

(*INO* + *LB2*), 25 to 100 = 0 if (*INO* + *LB2*) < 25%,
= (*INO* + *LB2*) − 25% if (*INO* + *LB2*) ≥ 25%;

Q = market value of the firm divided by the replacement value of the assets,

RV = replacement value of assets (estimated),

INSTO = institutional ownership as reported by Value Line,

DEBT/RV = market value of debt divided by the replacement value of assets,

R&D/RV = research and development expenditures for the year divided by the replacement value of assets,

AD/RV = advertising expenditures for the year divided by the replacement value of assets.

we rank the firms in our samples according to the replacement value of assets and reestimate the piecewise regression for those firms ranked in the top half. For both the 1976 and the 1986 samples, the slopes of the segments between 0% and 5% and between 5% and 25% insider ownership are positive and the slope of the segment above 25% is negative. Thus, although our empirical results are consistent with the general theoretical argument advanced by Morck et al. that there is a nonlinear relation between corporate value and inside ownership, we are unable to replicate their specific empirical findings with our samples.

4. Further analysis

We now conduct various tests to determine the robustness of our results. It is possible that the relation between ownership structure and corporate value is spurious because Q's and ownership structure are industry-specific. That is, as indicated by Demsetz and Lehn (1985), ownership structure may be highly dependent on the firm's industry and, within an industry, Q's may be highly correlated. To investigate whether our results are a spurious by-product of a deeper relation between inside ownership, Q, and industry, we repeat our regressions after adjusting all of our variables for their industry average. For each four-digit SIC code, we compute the industry average value for each variable. This average is then subtracted from each observation of the variable, and the regressions reported in table 2 are reestimated. The curvilinear relation between Q and inside ownership is still present in the data. For 1976, however, the squared term is no longer significant, and for 1986, $INO + LB2$ is not significant. For all specifications, the coefficient of institutional ownership continues to be positive and significant. In a similar vein, we estimated the regression models excluding public utilities. Again, our main findings are not altered by this procedure. These results provide evidence against the argument that our findings are due to a correlation between Q and industry type.

In another sensitivity test, we truncate the distributions of Q and inside ownership at their 5th and 95th percentiles and reestimate the regressions. This procedure insures that our results are not driven by a few large outliers. Specifically, the negative and significant coefficient on the squared inside ownership term could be due to a few companies with relatively low Q ratios and high levels of insider ownership. Our tests indicate that this is not the case, however. The significant curvilinear relation between Q and insider ownership is still borne out in the regressions on the truncated samples.

Finally, arguments by Berle and Means (1932) and Jensen and Meckling (1976) about the relation between corporate value and equity ownership can be more generally interpreted as arguments about the relation between corporate performance and equity ownership. To investigate this issue, we estimate the regression in table 1 using return on assets (measured as

earnings before depreciation, interest and taxes divided by the replacement value of assets) as the dependent variable. In each regression, for both 1976 and 1986, the coefficient of inside ownership is positive and significant and the coefficient of inside ownership squared is negative and significant. Also, in each case, the coefficient of institutional ownership is positive and significant. When block ownership is combined with inside ownership, the coefficient of $(INO + LB2)$ is always positive and the coefficient of $(INO + LB2)^2$ is always negative. For 1976 the coefficients are always significant, but they are not always significant for 1986. Finally, when the blockholder variables are entered separately into the regressions, the signs of the coefficients of this variable are sometimes positive and sometimes negative and typically not significant. These results suggest that the relation between corporate performance and equity ownership is not a spurious result of the way in which performance is measured.

5. Conclusion

This paper explores the relation between corporate value and the structure of equity ownership. We find a strong curvilinear relation between Tobin's Q and the fraction of shares owned by corporate insiders. At low levels of insider ownership, the relation is strongly positive. Depending on the period considered, the relation between Q and insider ownership ranges from one-to-one to as high as three-to-one. At high levels of insider ownership, the relation between Q and insider ownership is negative, but the downward pull is relatively muted. Additionally, we find a strong positive relation between Q and the fraction of shares held by institutional investors. Finally, when block ownership is entered separately as an independent variable, we find no significant relation between Q and several alternative specifications of blockholder ownership.

These results are broadly consistent with Stulz (1988), who predicts that value will first increase, then decrease, as insider ownership increases. At low levels of insider ownership, our results are consistent with the arguments of Berle and Means (1932) and Jensen and Meckling (1976) and with the empirical results of Morck, Shleifer, and Vishny (1988). At insider ownership levels above 5%, however, our results are not consistent with theirs. At all levels of insider ownership, our results appear not to be consistent with the arguments of Demsetz (1983) and the empirical results of Demsetz and Lehn (1985), who suggest that there is no relation between ownership structure and corporate performance. Our results on institutional ownership are consistent with the efficient-monitoring hypothesis, proposed by Pound (1988), which predicts a positive relation between corporate value and institutional share ownership, while the lack of a significant relation between Q and various

measures of blockholder ownership does not support the importance of blockholders as a separate monitoring agent for corporate managers.

As in all empirical work, a number of caveats should be noted. Perhaps the most important is the question of causality between insider ownership and Q. It can be argued that managers and founders are more inclined to retain a large fraction of successful firms. It may also be that the managers of successful firms are more likely to be rewarded with additional forms of stock ownership. These firms also are more likely to be firms with high Q ratios. Such a scenario could explain a positive relation between Q and insider ownership, in which the line of causality runs from Q to insider ownership rather than the other way around. However, this line of reasoning cannot explain the observed negative relation between ownership and Q that occurs as ownership becomes highly concentrated in the hands of insiders. A second caveat has to do with the measurement of blockholder ownership. The measure we use does not distinguish among types of blockholders. Some blockholders may be entirely passive investors, whereas others are more active and do perform an important monitoring service. A finer classification scheme might reveal a more important role for active block investors.

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