ELSEVIER Journal of Financial Economics 39 (1995) 131–157

JOURNAL OF Financial ECONOMICS

Equity ownership and the two faces of debt

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(Received November 1992; final version received December 1994)

Abstract

We empirically investigate the relation between corporate value, leverage, and equity ownership. For 'high-growth' firms corporate value is negatively correlated with leverage, whereas for 'low-growth' firms corporate value is positively correlated with leverage. The results also hint that the allocation of equity ownership among insiders, institutions, blockholders, and atomistic outside shareholders is of marginally greater significance in low-growth than in high-growth firms. The overall interpretation of the results is that debt policy and equity ownership structure 'matter' and that the way in which they matter differs between firms with many and firms with few positive net present value projects.

Key words: Capital structure; Equity ownership; Growth opportunities
JEL classification: G32

1. Introduction

The positive and negative attributes of debt as a corporate financing instrument, as perceived both by financial scholars and perhaps to a lesser extent by practitioners, have evolved over the past several decades. In the aftermath of the

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We thank Jennifer Conrad, Werner De Bondt, David Denis, Michael Jensen, Wayne Marr, William Parke, Gordon Phillips, Jerry Thursby, Cynthia Van Hulle, Marc Zenner, an anonymous referee, and seminar participants at Clemson University, the Katholieke Universiteit Leuven, and the University of North Carolina at Chapel Hill for helpful comments. Carl Ackermann has provided excellent research assistance. Some of the work on this paper was completed when the second author was visiting the University of Chicago and the Katholieke Universiteit Leuven, Belgium.

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Great Depression and throughout the 1930s and 1940s, debt was predominantly viewed as a clearly evil, but occasionally necessary, ingredient of a well-managed corporation's capital structure, but even then only if used in careful moderation.[1] With the publication of the famous Modigliani and Miller (M&M) irrelevance proposition in 1958, academics' attitudes toward debt began to soften. This softening of attitude turned to a warm embrace in 1963, when M&M published their 'tax correction' paper. The embrace derived from, and was solely dependent on, the tax advantages of debt financing. Furthermore, the warmth of the embrace for debt financing was limited by the costs, especially bankruptcy costs, associated with it. If the deductibility of interest payments for tax purposes were ever to be rescinded, then presumably debt would once again assume its posture of an inferior financing instrument.

More recently, however, scholars have broadened their perspectives on debt financing, and have identified other virtues and vices associated with it as a corporate financing instrument.[2] Much of this attention has focused on the role of debt in influencing corporate investment decisions. On one side of the coin, Myers (1977) demonstrates that 'too much' debt induces managers acting in shareholders' interests to forego positive net present value projects. This phenomenon has been labeled the 'underinvestment' problem of debt financing. That is, for firms with 'growth opportunities' debt has a negative effect on the value of the firm. On the other side of the coin, Jensen (1986) argues that when firms have more internally generated funds than positive net present value investment opportunities, the presence of debt in the firm's capital structure forces managers to pay out funds that might otherwise have been invested in negative net present value projects. This argument requires an additional ingredient, however, and that is that managers are rewarded for expanding the scale of the firm, and therefore have an incentive to do so, even if it is detrimental to shareholders' interests. In this framework, managers have both the incentive and the opportunity (i.e., excess cash flow) to undertake wasteful investment projects. This phenomenon has been labeled the 'overinvestment problem'. The overinvestment problem can, however, be curtailed if managers are forced to pay out excess funds to service debt. That is, for firms with more internally generated funds than investment opportunities, debt financing has a positive effect on the value of the firm.

Fundamentally, the overinvestment problem arises because of a separation between corporate equity ownership and management. In Jensen's analysis, managers have an incentive to increase the size of the firm at shareholders' expense. They will do so, of course, unless their interests coincide with those of shareholders for some other reason. One way in which managers' and

[1] See, for example, Donaldson (1963).

[2] For a comprehensive review of the recent literature, see Harris and Raviv (1991).

shareholders' interests coincide is if they are one and the same. Equity ownership on the part of managers can align shareholders' and managers' interests, and thereby reduce the overinvestment problem.

Concern about the misallocation of resources that follows from the separation of ownership and management is, of course, not new. It can be traced, at least, to Berle and Means (1932). There are numerous, more recent contributors to the debate regarding the way in which the allocation of equity ownership between outsiders (i.e., atomistic shareholders) and insiders (i.e., managers) influences corporate value. They include, for example, Morck, Shleifer, and Vishny (MSV, 1988). As with debt, MSV argue that the managers' ownership of equity can have both a positive and a negative effect on the value of the firm. To put it simply, at low levels of management equity ownership, an increase in their shareholdings more closely aligns managers' and outside shareholders' interests. As insider ownership increases beyond some point, however, further increases effectively insulate managers from outside shareholder demands. At this point, managers can allocate corporate resources in their own self-interest regardless of the effects on outside shareholders.

Recent empirical contributions by Holderness and Sheehan (1988), MSV (1988), McConnell and Servaes (1990), Hermalin and Weisbach (1991), Phelps (1991), and Kole (1994) have explored the relation between corporate value and the allocation of shares among corporate insiders and other shareholders. While the results differ across the various studies, a consensus interpretation is that the allocation of equity ownership matters.

Despite the apparent theoretical connection between the roles of equity ownership and debt in determining the allocation of corporate resources, the empirical studies cited above have given only peripheral attention to the relation between corporate value, debt, and equity ownership. This paper seeks to fill that void. For the years 1976, 1986, and 1988, we separate large samples of firms into two categories, those with low growth opportunities and those with high growth opportunities. For each sample, we then investigate the relation between Tobin's Q, debt, and equity ownership. We find that for firms with few growth opportunities, Q is positively correlated with the level of debt financing. For firms with high growth opportunities, Q is negatively correlated with the level of debt financing. These results are consistent with the hypothesis that debt can have either a positive or negative effect on the value of the firm, depending upon the availability of positive net present value projects to the firm. As regards equity ownership, when Q is regressed against the fractions of shares owned by corporate insiders, institutional investors, and large-block shareholders, we find that the coefficients of these ownership variables are typically, but not always, larger for low-growth firms than for high-growth firms. We interpret these results as weakly supporting the conjecture that the allocation of equity ownership among corporate insiders and other investors is of greater importance in firms with fewer profitable investment opportunities.

Section 2 discusses in more detail related theoretical and empirical work, and develops the hypotheses to be tested. Section 3 describes the data employed in the analysis. Section 4 presents the results, Section 5 comments on the results, and Section 6 concludes.

2. Hypotheses

2.1. Growth and debt

Building on Myers (1977) and Jensen (1986), Stulz (1990) argues that debt can have both a positive and negative effect on the value of the firm (even in the absence of corporate taxes and bankruptcy costs). He develops a model in which debt financing can both alleviate the overinvestment problem and exacerbate the underinvestment problem. In Stulz's model, however, the origin of the underinvestment problem is fundamentally different from Myers'. Stulz assumes that managers have no equity ownership in the firm and that they receive utility from managing a larger firm, and, as a consequence, have an incentive to increase the size of the firm. This incentive leads managers to undertake negative net present value projects. Shareholders recognize this incentive.

The solution to the problem is twofold: First, shareholders force managers to issue debt. Second, shareholders, recognizing that managers have an incentive to overstate investment opportunities, are unwilling to contribute equity funds in the future. It turns out that the seeds of the underinvestment problem lie in the solution to the overinvestment problem. Because the firm has issued debt, managers are forced to pay out funds in the future. The net result is that financial resources available to management are limited, and that there are some occasions on which managers are forced to forego positive net present value investment opportunities. The tradeoff between the positive and negative effects of debt financing leads to an optimal level of debt that maximizes the value of the firm.

The element that Myers, Jensen, and Stulz have in common is that each focuses on a connection between the firm's investment opportunity set and the effect of debt on the value of the firm. Presumably, both the positive and negative effects of debt are present for all firms. However, a reasonable conjecture is that for firms with plentiful growth opportunities, the negative effect will predominate because, in at least some circumstances, debt forces managers to pass up positive net present value projects. That is, for firms with many positive net present value projects, the effect of debt on the value of the firm is negative. Similarly, a reasonable conjecture is that for firms with few growth opportunities, the positive effect will predominate because, in at least some circumstances, debt prevents managers from taking on negative net present value projects.

That is, for firms with few positive net present value projects, the effect of debt on the value of the firm is positive.

Recently, Lang, Ofek, and Stulz (1994) have explored the relation between leverage and future growth for all *Compustat* firms over the period 1970–89. They find a strong negative relation between leverage (book value of debt over total assets) and subsequent growth in number of employees and capital expenditures, but only for firms with poor investment opportunities (i.e., Tobin's $Q < 1$). Consistent with Jensen (1986) and Stulz (1990), these results suggest that leverage prevents firms with poor investment opportunities from overinvesting.

2.2. *Growth and inside equity ownership*

Morck, Shleifer, and Vishny (1988) begin with the presumption that managers respond to two opposing forces, and that the relation between ownership and corporate value depends upon which force dominates over any particular range of managerial equity ownership. Their analysis leads them to the conclusion that the relation between the value of the firm and inside equity ownership is nonlinear, but that the precise form of the relation cannot be predicted a priori. Furthermore, it is possible that the relation differs across different types of firms. They urge that the data be the judge.

Stulz (1988) also predicts that the relation between corporate value and the fraction of shares held by managers is nonlinear. He arrives at this conclusion by a different route, however. In Stulz's model, because managers receive utility from holding their positions with the firm, they resist any outside takeover attempt that would dislodge them from their managerial positions. The most powerful deterrent to an outside takeover is managers' ownership of shares. To be successful, the premium that a bidder must pay to acquire the firm increases as the fraction of shares held by managers increases. Concurrently, of course, as the fraction of shares held by managers increases, the probability that the takeover attempt will be successful declines. The value of the firm is a function of the premium that a bidder must pay to be successful and of the probability of the bidder's success. Because the first of these terms is a positive function of managerial equity ownership and the second is a negative function of managerial equity ownership, the value of the firm first increases, and then decreases as the fraction of shares held by managers increases.

MSV (1988) estimate the relation between corporate value and insider ownership. For the year 1980, using a sample of 371 *Fortune 500* firms, they estimate a piecewise linear regression in which Tobin's Q is the dependent variable and the fraction of shares held by corporate insiders (plus other control variables) is the independent variable. Their regressions indicate that Q increases as inside equity ownership rises up to 5 percent, then decreases as inside ownership increases to 25 percent. Finally, Q increases slightly again for inside ownership levels above 25 percent. McConnell and Servaes (1990) provide further evidence

on the relation between Q and the allocation of share ownership between corporate insiders and atomistic outside shareholders. In doing so, they recognize two other potentially important identifiable categories of corporate investors, large-block shareholders, and institutional investors.

Based upon Stulz (1988), McConnell and Servaes estimate a quadratic regression in which Tobin's Q is the dependent variable. Four independent variables are employed to represent the allocation of shares among the four constituent categories of investors (along with four control variables): (1) the fraction of shares owned by corporate insiders (i.e., officers and members of the board), (2) the fraction of shares owned by corporate insiders, squared, (3) a dummy variable to indicate the presence of a large-block shareholder,[3] and (4) the fraction of shares held by institutional investors. The regression is estimated for a sample of 1,173 firms for 1976 and a sample of 1,093 firms for 1986. In these regressions, the coefficient of the fraction of shares held by insiders is positive, and the coefficient of this variable squared is negative. Further, the coefficient of the fraction of shares held by institutional investors is positive and significant, but the coefficient of block ownership is never significantly different from zero. In short, McConnell and Servaes report a significant curvilinear relation between Q and the fraction of shares held by corporate insiders. Thus, their results are consistent with the empirical predictions of MSV and Stulz.

Note, however, that in neither the MSV nor the Stulz analyses do growth opportunities play a role. Thus, their analyses make no direct predictions as to whether the relation between corporate value and equity ownership differs between those firms with many investment growth opportunities and those with few. In that regard, our empirical analysis can be viewed as an exploration to determine whether the specific form of the relation between Q and equity ownership differs between firms with few and those with many growth opportunities.

Before doing so, however, we can make some predictions about the relative importance of equity ownership in high- and low-growth firms. Consider the following: The allocation of share ownership between insiders and other shareholders matters when the interests of the two groups are not aligned. If we assume, as suggested by Jensen (1986) and Stulz (1990), that managers receive utility from increasing the size of the firm, even if it is contrary to shareholders' interests, then the potential for divergence of interests is greatest in firms with fewer profitable growth opportunities. That is, managers prefer to manage a larger firm. If the firm has few profitable growth opportunities, the only way to increase its size is to undertake negative net present value projects. Thus, regardless of the specific form of the empirical relation between corporate value

[3]When the fraction of shares held by the largest single blockholder and the fraction of shares held by the blockholders in aggregate were used, there was no difference in results.

and the fraction of shares held by insiders, it is reasonable to predict that if the allocation of equity ownership matters, it will be more important in firms with fewer growth opportunities. The empirical prediction, then, is that the relation between Q and the fraction of shares held by insiders is stronger for firms with relatively fewer growth opportunities.

2.3. *Growth, blockholders, and institutional investors*

Of course, atomistic shareholders, managers, and members of the board of directors are not the only identifiable categories of equity owners. Two other investor categories have been identified as having a potentially important role in determining the allocation of corporate resources, institutional investors and large-block shareholders. Pound (1988) proposes that institutional investors may have either a positive or negative effect on the value of the firm. The positive effect occurs because institutional investors may be more efficient monitors of managers than are atomistic shareholders. The negative effect happens because institutional investors may collude with corporate managers against the best interests of atomistic shareholders, either because it is in the institutional investor's interest to do so, or because they are coerced into doing so by corporate managers. McConnell and Servaes (1990) report that the relation between Q and the fraction of shares held by institutional investors is positive and statistically significant across their full sample of firms for both 1976 and 1986. They interpret this result as being consistent with the efficient monitoring hypothesis. Pound makes no prediction as to whether the role of institutional investors differs between high- and low-growth firms. As with equity ownership by insiders, if managers' and outside shareholders' interests are more likely to diverge in firms with few growth opportunities, and if the efficient monitoring hypothesis is the appropriate interpretation of the positive relation between Q and the fraction of shares held by institutional investors, then presumably this relation is stronger for firms with fewer growth opportunities.

Shleifer and Vishny (1986) develop a model of the relation between the value of the firm and the presence of a large-block shareholder. In their model, the block shareholder takes an active role in the activities of the firm and, if the need arises, takes control of the firm and replaces poorly performing managers. McConnell and Servaes (1990) analyze the relation between Q and large-block shareholders, employing several different measures of block ownership. In none of their specifications, for either 1976 or 1986, is the relation between Q and block ownership statistically significant. They do not find evidence to support the hypothesis that blockholders are important monitors of corporate managers. They do not, however, separate their sample into firms with many and those with few profitable growth opportunities. If the blockholder monitoring hypothesis is correct, it is more likely to show up in firms with fewer profitable

growth opportunities. The prediction is that if blockholders perform an important monitoring function, the empirical relation between Q and the fraction of shares held by blockholders is stronger for firms with fewer growth opportunities.

3. Data

In constructing our database, we begin with the data employed by McConnell and Servaes (1990). Their 1976 sample includes 1,173 firms and their 1986 sample includes 1,093 firms listed on the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX). For each firm, data on insider, institutional, and block equity ownership are taken from the *Value Line Investment Survey*. Data employed to estimate Q are taken from *Compustat* and Hall (1990). The procedure used to construct these samples is described in McConnell and Servaes. For this paper, these samples are supplemented with a sample of firms from 1988. The starting point for assembly of the 1988 sample is all nonfinancial firms listed on the NYSE or the AMEX that are contained in the *Compustat* database for 1988. To be included in the sample for further analysis, we require that sufficient data be available to compute the firm's Tobin's Q. This yields a sample of 1,943 firms. For each of these firms, Tobin's Q is computed as the market value of common stock, preferred stock, and debt divided by the replacement value of assets. Leverage is estimated as the market value of long-term debt divided by the replacement value of assets ($DEBT/RV$).[4] Data on equity ownership are taken from *Disclosure, Inc.* These data include the number of shares held at year-end 1988 by corporate officers and members of the board of directors, the number of shares held by blockholders (where a blockholder is any shareholder who owns at least 5 percent of the outstanding stock and who is not an officer or director), and the number of shares held by institutional investors (where institutional investors include insurance companies, commercial banks, investment companies, pension funds, educational foundations, and trust funds). Firms are eliminated in this process if they are not listed on the *Disclosure* database, if the number of shares reported in the individual categories of equity ownership sums to a total greater than the reported number of shares outstanding, or if the *Disclosure* data are incomplete This requirement reduces the sample to 830 firms. Consistent with McConnell and Servaes (1990), to obviate problems with outlier observations, firms were further deleted if their Q ratios exceeded 6.0 or were less than 0.16. This screen reduced the sample to 826 firms.

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

We analyze the difference in the relation between Q, debt, and equity ownership for firms with many and those with few profitable growth opportunities. To distinguish between these two types of firms, we use the firm's price-to-operating-earnings (P/E) ratio. This ratio is calculated by dividing the stock price at the end of 1976, 1986, and 1988 by operating earnings per share for these years, as reported on the *Compustat* database. Because operating earnings are calculated before interest payments, the earnings number is unaffected by leverage. Firms with negative operating earnings are discarded from the sample; 20 firms are deleted for 1976, 46 are deleted for 1986, and 48 are deleted for 1988.

For each year, firms are ranked according to their end-of-year P/E ratio. The one-third of the firms with the highest P/E ratio are placed into a high-growth sample and the one-third with the lowest P/E ratio into a low-growth sample.[5] Thus, there is a high-growth sample and a low-growth sample for 1976, 1986, and 1988. Descriptive statistics for each category of firms are displayed in Table 1.

By construction, the differences in the P/E ratios between the high- and low-growth samples are dramatic. For example, for the 1988 low-growth sample, the average P/E ratio is 2.70; for the high-growth sample it is 11.02. Similarly, for each year, the average Q ratios are dramatically different for the high- and low-growth samples; Q's for the high-growth samples are always much greater than those for the low-growth samples. The next four rows of the table give data on leverage and equity ownership. In each year, leverage is significantly greater for the low-growth sample than it is for the high-growth sample. These data evidence a negative relation between growth opportunities and leverage. However, these data are also consistent with the joint conjecture that for firms with many positive net present value projects (i.e., the high P/E sample), the negative effects of debt on their investment opportunities are more consequential than are the positive effects. For firms with few positive net present value projects (i.e., the low P/E sample), the positive effects of debt are greater than the negative effects. This joint conjecture would predict a relatively higher use of debt for low-growth firms than for high-growth firms, and it is this effect that gives rise to the apparent negative relation between growth and debt for the overall sample. To distinguish between these possibilities, we estimate separate cross-sectional regressions for the high- and low-growth samples. If our conjecture is correct, the correlation between Q and leverage will be negative for the high-growth sample and positive for the low-growth sample.

The rest of our story has to do with the role of equity ownership in high- and low-growth firms. The three equity ownership variables are the percent of shares

[5]We repeated all our analyses using the top and bottom quartiles of the growth classification. In general, these results are more supportive of our hypotheses than the results based on the classification into three equal groups presented in this paper. These results are available from the authors upon request.

Table 1

Summary statistics for 1976, 1986, and 1988 for samples of firms classified into high- and low-growth samples according to their P/E ratio. Sample means are on the first line of each row and medians are in parentheses below. P-values are reported for tests of equality of the means and medians of the high- and low-growth samples. All firms are listed on the NYSE or the AMEX. Balance sheet data are obtained from *Compustat*; ownership data are obtained from *Value Line* for the 1976 and 1986 samples and from *Disclosure* for the 1988 sample.

	1976			1986			1988		
Variable	Low-growth	High-growth	P-value diff.	Low-growth	High-growth	P-value diff.	Low-growth	High-growth	P-value diff.
Sample size	330	331		292	292		259	260	
P/E	1.94	6.62	0.00	3.14	10.84	0.00	2.70	11.02	0.00
	(1.99)	(5.41)	(0.00)	(3.28)	(9.24)	(0.00)	(2.83)	(7.99)	(0.00)
Q	0.674	1.309	0.00	0.905	1.781	0.00	0.913	1.58	0.00
	(0.817)	(1.155)	(0.00)	(0.897)	(1.547)	(0.00)	(0.904)	(1.35)	(0.00)
$DEBT/RV$ (%)	20.98	11.19	0.00	29.41	15.39	0.00	30.69	15.95	0.00
	(20.20)	(10.38)	(0.00)	(27.99)	(10.70)	(0.00)	(29.88)	(12.37)	(0.00)
$INOWN$ (%)	12.88	14.90	0.14	8.54	13.97	0.00	6.37	11.10	0.00
	(5.00)	(7.00)	(0.17)	(1.50)	(9.05)	(0.00)	(0.75)	(4.30)	(0.00)
LB (%)	3.23	3.36	0.89	6.27	5.99	0.81	11.64	12.62	0.52
	(0.00)	(0.00)	(0.75)	(0.00)	(0.00)	(0.97)	(5.56)	(6.20)	(0.58)
$INSTO$ (%)	3.56	6.36	0.00	33.65	40.97	0.00	34.95	37.48	0.16
	(1.74)	(4.97)	(0.00)	(32.22)	(41.32)	(0.00)	(32.63)	(37.90)	(0.15)
RV ($million)	1116	1272	0.45	5891	1458	0.00	5327	1120	0.00
	(294)	(426)	(0.01)	(1678)	(485)	(0.00)	(1373)	(265)	(0.00)

P/E: end-of-year price divided by operating earnings per share during the year.
Q: market value of common stock, preferred stock, and debt divided by the estimated replacement value of assets.
$DEBT/RV$: estimated market value of debt divided by the estimated replacement value of assets.
$INOWN$: fraction of common stock (in percent) owned by corporate officers and members of the board of directors.
LB: fraction of common stock (in percent) owned by all outside shareholders who own more than 5% of the common stock.
$INSTO$: fraction of common stock (in percent) owned by institutional investors.
RV: estimated replacement value of assets.

owned by corporate insiders (*INOWN*), the percent of shares held by all blockholders (*LB*), and the percent of shares held by institutional investors (*INSTO*). In each year, the mean (median) percentage of shares owned by corporate insiders and institutional investors is greater in the high-growth than in the low-growth sample. The difference is statistically significant in two of the three years. The percentage of shares held by blockholders is not noticeably different between the high- and low-growth samples. Contrary to our conjecture, these data could suggest that equity ownership is more important in high-growth than in low-growth firms. However, these univariate tests do not control for other factors that may influence concentration of equity ownership, such as the size of the firm. Table 1 shows that in two of the three years high-growth firms are significantly smaller in their replacement value of assets, and that these are the two years for which insider ownership is significantly lower in the low-growth sample. If capital constraints inhibit managers in larger firms from acquiring a large fraction of the stock, our univariate results might emerge, even though insider ownership is more important in low-growth firms. To investigate this possibility, we estimate cross-sectional regressions between firm value and insider ownership. If our story is correct, we expect insider ownership to be more highly correlated with firm value for low-growth firms than for high-growth firms. The same is true for the percentage of shares held by institutional investors and by blockholders.

4. Regression results

4.1. Value and leverage

The functional form of the regressions that we estimate follows McConnell and Servaes (1990). Specifically, the dependent variable in the regressions is Tobin's *Q*. The independent variables are *DEBT/RV*, *INOWN*, *INOWN*-squared, *LB*, *INSTO*, *R&D/RV*, *ADV/RV*, and *RV*. The variables *R&D/RV*, *ADV/RV*, and *RV* are included as control variables because they have been shown elsewhere to be statistically significant in explaining *Q*. As a preliminary step in the analysis, the quadratic regression estimated in McConnell and Servaes (1990) for 1976 and 1986 is estimated with the full 1988 sample. The results are remarkably similar to those reported for 1976 and 1986. The coefficient of *INOWN* is positive and significant ($t = 3.24$), and the coefficient of *INOWN*-squared is negative and significant ($t = -2.53$). These results are consistent with MSV (1988), who predict a nonlinear relation between corporate value and ownership of equity by insiders, and with Stulz's (1988) more specific prediction of a curvilinear relation between corporate value and inside equity ownership. Additionally, as it is for 1976 and 1986, the 1988 coefficient of *INSTO* is positive and significant ($t = 3.16$). Different from 1976 and 1986, the

1988 regressions show a significant positive relation between Q and the fraction of shares controlled by large blockholders ($t = 2.61$). Overall, the results indicate that the distribution of equity ownership is related to the value of the firm; the consistency of the relation between Q and equity ownership across years is, at a minimum, reassuring.[6]

The more important question for this paper, though, is whether the relation between corporate value and debt differs between those firms with few and those with many growth opportunities. In the regressions, corporate value is standardized by the replacement value of assets (i.e., market value of assets/replacement value of assets = Q) as is debt (i.e., market value of debt/replacement value of assets = $DEBT/RV$). The results of the regressions are reported in Table 2.

For each year in the low-growth (i.e., low P/E) sample, the coefficient of debt is positive and significant (p-values are 0.00 for all years). For each year in the high-growth sample, the coefficient of debt is negative and significant (p-values are 0.00, 0.00, and 0.07, respectively). Additionally, for each year, the coefficients of the leverage variable for the high- and low-growth samples are different from each other at the 0.001 level of significance. These results are consistent with our conjecture and suggest that debt plays a fundamentally different role in firms with many and in those with few positive net present value investment opportunities. The magnitude of the coefficients indicates that the leverage effect is also economically consequential. For example, in the 1988 low-growth sample, the 25th percentile of the leverage ratio is 19.80 percent and the 75th percentile is 39.03 percent. According to our regression, an increase in leverage from the 25th to the 75th percentile is associated with an *increase* in Q of 0.11. For the high-growth sample, the 25th percentile of the leverage ratio is 4.11 percent and the 75th percentile is 24.60 percent. According to our regression, an increase in leverage from the 25th to the 75th percentile is associated with a *decrease* in Q of 0.14.

The empirical results may, of course, depend on the specific classification scheme and variable definitions employed. A particular concern here is whether the P/E ratio comprises a reasonable proxy for the firm's future investment growth opportunities. As an alternative measure of growth opportunities, we collected sales growth forecasts from the *Value Line Investment Survey*. For 1988, not all of the companies are listed in *Value Line*, and *Value Line* does not provide sales growth forecasts for every firm that is listed. As a result, our 1988 sample declines to 530 observations. For 1976 and 1986, all firms are listed in *Value Line*, but, as with 1988, sales growth forecasts are not available for every firm. The result is a sample of 924 observations in 1976 and 899 observations in

[6]One reason these results are reassuring is that for 1976 and 1986, the ownership data are taken from *Value Line Investment Survey*, whereas the ownership data for 1988 are taken from *Disclosure, Inc.* Occasionally, debates have arisen as to which of these two data sources is the more reliable. This analysis suggest that the results are robust to alternative sources of equity ownership data.

1986. Again, we subdivide our sample into three groups of equal size according to their *Value Line* sales growth forecasts. The middle third of the sample is discarded, and our regression models are estimated separately for the high-and low-growth firms. The results displayed in Table 3 confirm our previous findings. For low-growth firms, the relation between firm value and leverage is positive and significant; for high-growth firms, the relation is negative and significant. Further, the sizes of the debt coefficients are comparable to those in Table 2 for both the high- and low-growth samples.

A shortcoming of the *Value Line* sales growth forecast is that it is not available for all firms in our sample, especially for 1988. To remedy this deficiency, we employ the firm's five-year historical growth rate in sales as a proxy for future growth opportunities. One possible concern with this measure of future growth opportunities is that it relies upon historical growth, and presumes that historical growth is a reasonable proxy for future growth opportunities. A second problem is that the observed growth in sales may represent an increase in sales due to an acquisition rather than to positive net present value investment opportunities. For both of these deficiencies, we note that the results we generate with this classification scheme may be weakened by misclassification of high- and low-growth firms.

Further, there is an alternative interpretation for the results based on this classification scheme. If the lowest-quality firms increased growth the most through debt-financed acquisitions, we would find a negative relation between leverage and firm value for high-growth firms. But this finding is unrelated to our story that debt 'crowds out' investment by high-growth firms.

With the above caveats in mind and with the classification scheme based on five-year historical average growth rates in sales, the regressions are estimated for the high- and low-growth samples for 1976, 1986, and 1988. The results are reported in Table 4. As before, for each year in the low-growth sample, the coefficient of $DEBT/RV$ is positive and significant; for each year in the high-growth sample, the coefficient of $DEBT/RV$ is negative and significant; and the magnitudes of the debt coefficients continue to be comparable to those in Table 2. Again, these results suggest that debt plays a fundamentally different role in high- and low-growth firms. For low-growth firms an increase in leverage is associated with an increase in value, whereas for high-growth firms an increase in leverage is associated with a decrease in value.

We also estimate our regressions after excluding all firms that made acquisitions over the six-year period during which the historical sales growth rate is estimated. Firms that made acquisitions during this period are identified via the footnotes in the *Compustat* database. The footnotes indicate whether individual data items have been affected by acquisitions. This procedure excludes 348 firms in 1976, 458 firms in 1986, and 411 firms in 1988, thereby reducing our sample size by about half in each year. Our results (not reported) remain essentially unchanged for 1976 and 1988. That is, the relation between corporate value and

Table 2

Cross-sectional regression analysis of Tobin's Q on debt, equity ownership, and control variables for samples of firms from 1976, 1986, and 1988 classified into high- and low-growth categories according to their P/E ratios. P-values are in parentheses below the coefficients. All firms are listed on the NYSE or the AMEX. Balance sheet data are obtained from *Compustat*; ownership data are obtained from *Value Line* for the 1976 and 1986 samples and from *Disclosure* for the 1988 sample.

	1976		1986		1988	
Variable	Low-growth	High-growth	Low-growth	High-growth	Low-growth	High-growth
N	330	331	292	292	259	260
Intercept	0.55	1.12	0.51	1.53	0.59	1.46
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DEBT/RV	0.25	− 1.13	0.56	− 1.11	0.58	− 0.70
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.07)
INOWN	0.48	0.81	1.09	2.34	1.62	0.31
	(0.00)	(0.14)	(0.00)	(0.04)	(0.00)	(0.74)
$INOWN^2$	− 0.79	− 0.08	− 1.36	− 4.19	− 2.48	− 1.13
	(0.00)	(0.92)	(0.00)	(0.06)	(0.01)	(0.46)
LB	0.07	− 0.08	0.34	− 0.17	0.31	0.39
	(0.34)	(0.81)	(0.00)	(0.64)	(0.01)	(0.20)

INSTO	0.31	1.43	0.31	0.29	0.21	0.01
	(0.06)	(0.01)	(0.00)	(0.31)	(0.03)	(0.97)
R&D/RV	2.35	3.05	1.21	− 0.15	− 0.78	0.51
	(0.00)	(0.07)	(0.12)	(0.93)	(0.43)	(0.64)
ADV/RV	0.21	1.58	0.64	4.47	0.25	3.85
	(0.50)	(0.08)	(0.11)	(0.00)	(0.71)	(0.00)
RV	− 0.000006	− 0.000003	− 0.00	− 0.00001	− 0.000002	− 0.000004
	(0.04)	(0.83)	(0.63)	(0.47)	(0.12)	(0.89)
Adj. R^2	0.11	0.11	0.28	0.07	0.20	0.06

Q: market value of common stock, preferred stock, and debt divided by the estimated replacement value of assets.
DEBT/RV: estimated market value of debt divided by the estimated replacement value of assets.
INOWN: fraction of common stock (in percent) owned by corporate officers and members of the board of directors.
LB: fraction of common stock (in percent) owned by all outside shareholders who own more than 5% of the common stock.
INSTO: fraction of common stock (in percent) owned by institutional investors.
R&D/RV: research and development expenditures for the year divided by the replacement value of assets.
ADV/RV: advertising expenditures for the year divided by the replacement value of assets.
RV: estimated replacement value of assets.

Table 3

Cross-sectional regression analysis of Tobin's Q on debt, equity ownership, and control variables for samples of firms from 1976, 1986, and 1988 classified into high- and low-growth categories according to the *Value Line* sales growth forecasts. P-values are in parentheses below the coefficients. All firms are listed on the NYSE or the AMEX. Balance sheet data are obtained from *Compustat*; ownership data are obtained from *Value Line* for the 1976 and 1986 samples and from *Disclosure* for the 1988 sample.

	1976		1986		1988	
Variable	Low-growth	High-growth	Low-growth	High-growth	Low-growth	High-growth
N	287	296	285	310	188	194
Intercept	0.57	1.18	0.54	1.89	0.45	1.74
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DEBT/RV	0.42	− 2.02	0.28	− 1.91	0.60	− 0.88
	(0.04)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
INOWN	0.34	0.49	1.80	1.47	0.99	0.40
	(0.31)	(0.32)	(0.00)	(0.05)	(0.07)	(0.73)
$INOWN^2$	0.27	− 0.09	− 2.69	− 2.40	− 0.66	− 1.05
	(0.65)	(0.91)	(0.00)	(0.06)	(0.52)	(0.73)

LB	0.17	0.38	0.26	− 0.37	0.68	− 0.40
	(0.38)	(0.24)	(0.01)	(0.20)	(0.00)	(0.21)
INSTO	0.46	1.54	0.19	0.25	0.33	− 0.63
	(0.36)	(0.00)	(0.02)	(0.31)	(0.01)	(0.04)
R&D/RV	− 0.24	3.54	2.50	− 1.80	1.07	1.43
	(0.88)	(0.02)	(0.00)	(0.19)	(0.24)	(0.25)
ADV/RV	− 0.13	2.46	1.26	3.79	0.65	3.32
	(0.85)	(0.01)	(0.01)	(0.00)	(0.37)	(0.00)
RV	− 0.000002	− 0.000007	− 0.000001	− 0.00002	− 0.000001	− 0.000006
	(0.56)	(0.41)	(0.64)	(0.08)	(0.75)	(0.09)
Adj. R^2	0.04	0.25	0.16	0.17	0.18	0.14

Q: market value of common stock, preferred stock, and debt divided by the estimated replacement value of assets.
DEBT/RV: estimated market value of debt divided by the estimated replacement value of assets.
INOWN: fraction of common stock (in percent) owned by corporate officers and members of the board of directors.
LB: fraction of common stock (in percent) owned by all outside shareholders who own more than 5% of the common stock.
INSTO: fraction of common stock (in percent) owned by institutional investors.
R&D/RV: research and development expenditures for the year divided by the replacement value of assets.
ADV/RV: advertising expenditures for the year divided by the replacement value of assets.
RV: estimated replacement value of assets.

Table 4

Cross-sectional regression analysis of Tobin's Q on debt, equity ownership, and control variables for samples of firms from 1976, 1986, and 1988 classified into high- and low-growth categories according to their five-year historical sales growth. P-values are in parentheses below the coefficients. All firms are listed on the NYSE or the AMEX. Balance sheet data are obtained from *Compustat*; ownership data are obtained from *Value Line* for the 1976 and 1986 samples and from *Disclosure* for the 1988 sample.

	1976		1986		1988	
Variable	Low-growth	High-growth	Low-growth	High-growth	Low-growth	High-growth
N	321	324	293	293	246	247
Intercept	0.50	1.32	0.48	2.05	0.43	1.60
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DEBT/RV	0.44	− 2.63	0.29	− 1.66	0.67	− 1.42
	(0.01)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
INOWN	0.72	0.41	2.15	1.04	2.19	1.65
	(0.01)	(0.43)	(0.00)	(0.23)	(0.00)	(0.03)
$INOWN^2$	− 0.79	0.54	− 3.35	− 1.97	− 3.70	− 2.58
	(0.10)	(0.56)	(0.00)	(0.24)	(0.00)	(0.09)

LB	0.02	− 0.20	0.33	− 0.42	0.23	− 0.14
	(0.88)	(0.50)	(0.05)	(0.18)	(0.16)	(0.54)
INSTO	1.04	1.69	0.27	0.12	0.46	− 0.06
	(0.02)	(0.00)	(0.03)	(0.65)	(0.00)	(0.76)
R&D/RV	2.16	1.38	2.27	− 3.01	0.81	− 0.23
	(0.06)	(0.38)	(0.06)	(0.03)	(0.07)	(0.76)
ADV/RV	1.95	1.78	3.71	1.19	2.52	− 0.11
	(0.04)	(0.06)	(0.00)	(0.34)	(0.00)	(0.85)
RV	0.0001	− 0.00002	0.000001	− 0.00002	− 0.000008	− 0.000007
	(0.11)	(0.01)	(0.84)	(0.00)	(0.09)	(0.02)
Adj. R^2	0.09	0.32	0.18	0.17	0.11	0.12

Q: market value of common stock, preferred stock, and debt divided by the estimated replacement value of assets.
DEBT/RV: estimated market value of debt divided by the estimated replacement value of assets.
INOWN: fraction of common stock (in percent) owned by corporate officers and members of the board of directors.
LB: fraction of common stock (in percent) owned by all outside shareholders who own more than 5% of the common stock.
INSTO: fraction of common stock (in percent) owned by institutional investors.
R&D/RV: research and development expenditures for the year divided by the replacement value of assets.
ADV/RV: advertising expenditures for the year divided by the replacement value of assets.
RV: estimated replacement value of assets.

leverage is positive and statistically significant for low-growth firms and negative and statistically significant for high-growth firms. For 1986, the relation between corporate value and leverage for high-growth firms is negative and significant. For low-growth firms, the relation between corporate value and leverage is also negative, albeit not significant.

We perform one additional sensitivity test on our growth measure. We subdivide the sample into three groups according to the firms' Q ratios. (Q can be thought of as a measure of future growth opportunities, since Q can be defined as the capitalized value of income from assets in place plus the capitalized value of future investment opportunities divided by the replacement value of the assets.) The results based on this classification procedure are consistent with the results based upon other classification schemes. For low-growth (i.e., low Q) firms, the relation between Q and debt is positive and significant. For high-growth (i.e., high Q) firms, the relation between Q and debt is negative and significant.[7] Thus, our results appear to be robust to the choice of a growth measure.

In each of the regressions so far, corporate value and debt are standardized by the replacement value of assets. An alternative measure by which these variables can be standardized is the book value of assets. In this regression, the dependent variable is the market value of the firm divided by the book value of assets. The independent variables are the market value of debt divided by the book value of assets, *INOWN*, *INOWN*-squared, *INSTO*, *LB*, advertising expenditures for the year divided by the book value of assets, research and development expenditures for the year divided by the book value of assets, and the book value of assets. The regressions are then re-estimated for each year for both the high- and low-growth samples, where the firms are classified as high- or low-growth according to their P/E ratios. The coefficients of the leverage variable from these regressions are reported in panel A of Table 5. For the low-growth samples, each of the coefficients is positive and significantly different from zero; for the high-growth samples, each of the coefficients is negative and statistically significant, and the sizes of the coefficients are again comparable to those in Table 2. These results indicate that our findings do not depend on the use of the replacement value of assets to standardize the variables employed in our regression analysis.

In each of the regressions to this point, the dependent and independent variables have been scaled by either the replacement value of assets or the book value of assets. A third candidate with which the variables could be scaled is the

[7]The problem with this classification procedure, however, is that we sample on Q before estimating the regression, which is not appropriate since it violates the assumptions of OLS regressions. As an alternative measure, we employ the firm's industry Q ratio as our growth measure and the firm's individual Q ratio as the dependent variable. The results based on this procedure are again similar to those reported in Tables 2, 3, 4, and 5.

Table 5

Coefficients on leverage variable using different standardization variables. This table presents the coefficient of the measure of leverage in cross-sectional regressions of firm value on leverage, ownership structure, and control variables, where firm value and leverage are standardized by the book value of assets and the market value of the firm. The P/E ratio is used to subdivide the sample into low- and high-growth firms. P-values are in parentheses below the coefficients.

	1976		1986		1988	
Variable	Low-growth	High-growth	Low-growth	High-growth	Low-growth	High-growth
Panel A						
Standardization measure:	0.17	− 1.91	0.28	− 1.30	0.35	− 0.91
Book value of assets	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Panel B						
Standardization measure:	− 0.37	− 3.01	− 0.17	− 3.32	− 0.14	− 2.56
Market value of firm	(0.00)	(0.00)	(0.08)	(0.00)	(0.13)	(0.00)

All the differences in coefficients between the low-growth and high-growth samples are significant at the 0.1% level.

market value of the firm. The virtue of this variable is that the debt ratio would be specified in terms of market values – the market value of debt divided by the market value of the firm. It could be argued that the market value leverage ratio is the appropriate ratio to use in investigating the questions here. Of course, the deficiency of normalizing by the market value of the firm is that the left-hand side of the regressions becomes market value of the firm divided by the market value of the firm. A way to circumvent this problem is to continue to use market value of the firm divided by the replacement value as the dependent variable, and to scale debt, advertising expenditures, and R&D expenditures by the market value of the firm. This procedure solves one problem, but introduces another. In particular, the market value of the firm enters as the numerator of the left-hand-side variable and the denominator of the right-hand-side variable. Therefore, the coefficient on the independent variables, and especially the leverage variable, will have a negative bias. This bias can be strong enough to change the sign on the leverage variable from positive to negative in the low-growth regressions. Lang, Ofek, and Stulz (1994) also point out this problem. They note that since firms do not adjust leverage continuously, but instead make large discrete adjustments, an increase in the value of the firm increases its Q ratio and decreases its leverage ratio. This induces a negative relation between Q and leverage. Nevertheless, the market value of debt standardized by the market value of the firm can still lead to useful insights on the relation between leverage and firm value. Whereas, because of the downward bias, the coefficient of the leverage variable may be negative for both the low- and high-growth sample, our story predicts that the coefficient of debt for the low-growth sample will be significantly greater than the coefficient of the high-growth sample.

Panel B of Table 5 presents the results, using the replacement value of assets to standardize the market value of the firm, and the market value of the firm to standardize the market value of debt, R&D expenditures, and advertising expenditures. Several comments are in order: First, the coefficients of the debt variable are negative in both the high- and low-growth samples in each year. However, consistent with the possibility that this specification of the regression induces a negative bias in the coefficients, the coefficients of the debt variable in the high-growth sample are much larger in absolute value than the coefficients of the debt variable in any of the other regressions for the high-growth sample. Second, the negative coefficients of the debt variable in the high-growth sample are significantly different from zero at the 0.001 level in each year, whereas the coefficient of the debt variable in the low-growth sample is significantly different from zero at the 0.05 level only in 1976 (although the p-values are 0.08 and 0.13 in 1986 and 1988). Third, the coefficients of the debt variable in the high-growth sample range from 10 to 20 times the magnitude of the coefficients of the debt variable in the low-growth sample. For example, for 1988, the coefficient of the debt variable is -0.14 ($t = -1.53$) in the low-growth sample, compared with the coefficient of -2.56 ($t = -7.01$) in the high-growth sample.

Further robustness tests could be conducted using other definitions of growth and other measures of corporate leverage, and undoubtedly some of the results would not be consistent with the tests conducted so far. Overall, though, the estimated regressions indicate that the relation between corporate value and leverage is fundamentally different between firms with few, and those with many positive net present value investment opportunities. Moreover, the results are consistent with the proposition that debt has both a positive and a negative effect on the value of the firm. The negative effect is more pronounced for firms with many positive net present value investment opportunities, whereas the positive effect is more pronounced for firms with few positive net present value investment opportunities.

4.2. *Value and equity ownership*

We now turn to the question of whether the relation between Q and equity ownership differs between low- and high-growth firms. Here the predictions are somewhat softer. The prediction is not that the relation between corporate value and the fraction of shares owned by insiders, institutional investors, or block stockholders is positive for low-growth firms and negative for high-growth firms, it is only that ownership by these groups is likely to be more important for low-growth than for high-growth firms. Visual inspection of Tables 2, 3, and 4 provides some (albeit weak) support for that contention. For each year, and for both measures of growth opportunities, the coefficient of insider ownership ($INOWN$) is positive; eight times out of nine it is significantly greater than zero for the low-growth sample. For each regression of the high-growth sample, the coefficient of $INOWN$ is positive, but significantly different from zero in only two of the nine regressions. These results hint that the fraction of shares held by insiders is more closely tied to corporate value for low-growth than for high-growth firms. There is, however, a fly in the ointment: In three of the nine pairs of regressions, the coefficient of $INOWN$ is larger in the high-growth than in the low-growth sample. In two of those three cases, the coefficient is also significantly different from zero. The insignificance of the coefficient of $INOWN$ in the high-growth sample in the other cases could be due to the greater dispersion in the Q ratios for the high-growth firms. For example, in 1988, when the P/E ratio is used to classify firms, the standard deviation of the Q ratio in the low-growth sample is 0.31, whereas the standard deviation of the Q ratio in the high-growth sample is 0.82.

The coefficients of institutional ownership ($INSTO$) and block ownership (LB) are also mixed. For LB the coefficient of the low-growth sample is larger than the coefficient of the high-growth sample in seven of the nine regressions. For $INSTO$ the coefficient of the low-growth sample is larger than the coefficient of the high-growth sample in only five of the nine regressions. Interestingly, the coefficient of block ownership is positive in all nine low-growth regressions

and positive and significant in five of the nine low-growth regressions. These results indicate that block equity ownership is more likely to be related to firm value in those firms that have few positive net present value investment opportunities.

Overall, the regressions give only modest support to the proposition that the distribution of equity ownership among insiders, blockholders, institutional investors, and atomistic shareholders is more consequential in low- than in high-growth firms. There is, however, another intriguing relation in the data: The regressions for both the low- and high-growth samples show evidence of a curvilinear relation between Q and inside ownership in which Q first increases, and then decreases, as the fraction of shares owned by insiders increases. This result holds in eight of the nine regressions. Thus, the fundamental relation between Q and inside ownership documented by McConnell and Servaes (1990) appears to prevail for both low- and high-growth firms. Along these lines a caveat is appropriate, however: While the curvilinear relation exists in eight of the nine regressions, the coefficients are not significant in every case.

5. Commentary

Results from the types of regressions that we present here are, of course, subject to multiple interpretations. In describing the empirical results, we have trodden carefully around the question of causality. In the story that we propose to explain the results, the direction of causality clearly runs from leverage to value. The story also attributes a different role to debt for firms with many and those with few positive net present value projects. In describing the empirical results, however, we have been careful to use causality-free terms such as 'association' or 'relation' between the dependent and independent variables. A reversal of causality means that value determines leverage, and that more valuable high-growth firms choose to have less leverage than less valuable high-growth firms. Conversely, more valuable low-growth firms choose to have more leverage than less valuable low-growth firms. The data cannot reject that interpretation. Indeed, we could envision a story that leads to that prediction.

The 'pecking order' theory proposed by Myers (1984) does suggest a negative relation between firm value and leverage, where leverage is determined by firm value. According to the pecking order theory, firms first use internally generated funds to finance their projects. When internally generated funds are exhausted, the firm turns to debt financing. Only as a last resort is additional equity issued. Thus, our results for high-growth firms are consistent with the pecking order theory. For low-growth firms, however, we find a positive relation between firm value and leverage, while the pecking order theory predicts a negative correlation. Here too, it is possible to make a reverse causality argument; that is, for low-growth firms, firms with higher Q ratios choose to have more leverage.

If our tests fail to control for growth opportunities within the high-growth and low-growth samples, it is possible that our measure of firm value (i.e., Q) also proxies for growth opportunities. A firm with better growth opportunities will generate higher cash flows in the future, and consequently it can issue more debt currently. This might lead to a positive relation between Q and the ratio of the market value of debt to the replacement value of the firm's assets. But this argument assumes that differences in Q are due to differences in growth opportunities. To investigate this assumption, we add both the P/E ratio and our measure of past sales growth to the estimated regression models. In several of the models, we find a significant positive relation between Q and our measures of growth, but our other results remain unchanged. In particular, we always find a strong positive relation between leverage and firm value for low-growth firms, and a strong negative relation between leverage and firm value for high-growth firms. If anything, the statistical significance of our results increases.

The equity ownership results are also subject to the same criticism. As with debt, the direction of causality in our story runs from equity ownership to Q, but care must be taken in that interpretation. McConnell and Servaes (1990) note that the direction of causality could run in the opposite direction. They do point out, however, that it is difficult to reconcile the reverse causality argument (where managers who perform well are compensated with additional stock) with the negative relation between ownership and Q that occurs at high levels of insider ownership. Concerning the positive association between block equity ownership and corporate value in some low-growth specifications, it is possible that blocks are formed after superior firm performance. Thus, it is possible that causality is reversed. What is less clear, however, is why this would occur only for firms with few growth opportunities. This issue perhaps deserves further exploration if reverse causality is the explanation for these results.

6. Summary and conclusions

This paper explores empirically the cross-sectional relation between Tobin's Q, debt, and equity ownership for high- and low-growth firms. The analysis is conducted with large samples of U.S. firms for the years 1976, 1986, and 1988. The investigation is motivated by the theoretical work of Myers (1977), Jensen (1986), Shleifer and Vishny (1986), Stulz (1988, 1990), and Morck, Shleifer, and Vishny (MSV) (1988), and by the empirical work of MSV (1988) and McConnell and Servaes (1990). Prior theoretical work posits that debt has both a positive and negative effect on the value of the firm because of its influence on corporate investment decisions. Based on this prior theoretical work, we conjecture that the negative effect of debt will dominate the positive effect for firms with many positive net present value projects (i.e., high-growth firms) and that the positive effect will dominate the negative effect for firms with few positive net present

value projects (i.e., low-growth firms). The empirical prediction of this conjecture is that for high-growth firms the relation between corporate value and leverage is negative, and that for low-growth firms the relation between corporate value and leverage is positive.

Prior theoretical work also predicts that the value of the firm is a nonlinear function of the allocation of equity ownership between managers and outside shareholders, and a positive function of the presence of a large-block shareholder and of the fraction of shares held by institutional investors.

Prior empirical work supports the hypothesis that the relation between corporate value and the fraction of shares held by corporate insiders is nonlinear. In particular, with large samples of firms for 1976 and 1986, McConnell and Servaes (1990) document a significant curvilinear relation between Tobin's Q and the fraction of shares owned by corporate insiders: Q first increases as the fraction of shares held by corporate insiders increases, and then declines as insider ownership increases beyond some critical level. They also find that the relation between Q and the fraction of shares held by institutional investors is positive and significant. In sum, their results support the hypothesis that the allocation of equity ownership matters.

This paper extends the work of McConnell and Servaes in three ways. First, we find that the significant quadratic relation between Q and the fraction of shares held by corporate insiders is also present in 1988 data, as is the significant positive relation between Q and the fraction of shares held by institutional investors, thus providing further evidence that the allocation of equity ownership matters.

Second, when the sample is divided into high- and low-growth firms, we find that the relation between Q and debt is negative for high-growth firms and positive for the low-growth firms. These results indicate that debt also matters, and that the way in which it matters depends upon the investment opportunity set confronted by the firm.

Third, there is some (albeit weak) evidence that the allocation of equity ownership between corporate insiders and other types of investors is more important in low-growth than in high-growth firms. This evidence, although modest, is sufficiently intriguing to call for further exploration of whether the way in which equity ownership matters differs between firms, according to their investment opportunities and other characteristics.

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