



# The effect of product market strategies on the financial and ownership structures of firms

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## Abstract

**Purpose** – The purpose of this paper is to test whether product market strategies have any effect on managerial shareholdings, leverage usage and firm diversification.

**Design/methodology/approach** – The paper focuses on a sample of US manufacturing firms and defines variables to proxy for product quality, ownership, financing and diversification. Regressions were run to test hypotheses.

**Findings** – A positive relation was found between product quality and managerial ownership and a negative relation between product quality and use of leverage. Also, controlling for firm size, it was found that firm focus is concave in managerial shareholdings.

**Research limitations/implications** – Although the paper provides a path towards understanding intra-industry variations in corporate capital structures, it is recognized that additional research on such variations is warranted.

**Practical implications** – The paper provides an explanation for the evidence that all-equity firms are distinguished by large management shareholdings. In fact, one such firm, Microsoft Corporation, provides one of the best examples of the paper's argument on why concentrated managerial shareholdings and financial slack facilitate an aggressive approach to protect a firm's margins.

**Originality/value** – This paper contributes to the literature, which relates product market competition to corporate capital structure and uses a different regression model than used in prior research. Specifically, the quasi-likelihood approach for fractional variables was used. Ownership variables are fractional variables that are not censored or logistic normally distributed, as presumed in some prior literature.

**Keywords** Corporate governance, Capital structure, Product management, Marketing strategy, United States of America

**Paper type** Research paper

## Introduction

Demsetz and Lehn (1985) argue that the ownership structures of firms vary systematically in ways that are consistent with firm value maximization. Further, they posit three general forces affecting corporate ownership structures:

- (1) value-maximizing size;
- (2) profit or "control" potential; and

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(3) whether the firm is subject to systematic regulation.

In addition, the authors note that the amenity potential of a firm's product is another possible influence on the corporate ownership structure for select firms. Using sports teams and media companies as examples, Demsetz and Lehn (1985) argue that concentrated shareholdings enable managers to control or influence the quality and content of their product, for example, winning the super bowl or influencing the content of newspapers and television programmes, which some managers value.

Later research (Grossman and Hart, 1988) recognized amenities that accrue to controlling shareholders that are not tied to product quality or content. Benefits, greater compensation and the ability to provide employment for family and friends are such examples. These so-called private benefits of control are argued to motivate management to own a significant proportion of their firm's stock (Bebchuk, 1999). More recently, Myers (2000) examined the other side of this issue by focusing on the costs of foregoing control, such as the costs of using outside equity. Myers (2000) argues that decreased managerial ownership of equity raises the potential costs of using outside equity through, for example, the expropriation by outside equity block holders of the gains created by the efforts of inside shareholders. Using data on the financing of motion pictures, Fee (2002) reports evidence consistent with both the benefit and cost arguments presented above for concentrated managerial shareholdings. Fee (2002) found that filmmakers are less likely to use studio financing (i.e. outside equity) when their private artistic stake in the movie is high or their creative effort is more important.

Both Demsetz and Lehn (1985) and Fee (2002) focused on media companies, it is clear from examining the corporate ownership data that concentrated managerial shareholdings exist in firms in other United States (US) industries, including those in the manufacturing industries. What might motivate concentrated managerial shareholdings in these industries? If one follows Bebchuk's (1999) line of reasoning, the pursuit of the private benefits of control motivates such concentrated ownership structures. However, specifically what those benefits might be is less clear, especially in the light of Bebchuk's proposition that there is less scope for such benefits in the USA.

While not denying that the private benefits of control play a distinctive role, following the thrust of Fee's evidence, we suggest that the product market strategies of these manufacturing firms go further towards explaining the observed variations in managerial shareholdings. Specifically, we argue that concentrated managerial shareholding is a way of committing the firm to a product market strategy that seeks a competitive advantage through superior product quality and performance. Imagine a market in which consumers of the products and services can be segmented into two groups. Where some consumers are price-conscious and simply want the cheapest product they can purchase, others are less price-sensitive and want the best quality product or service available. Imagine also entrepreneurs who consider serving one of these market segments and must address how to finance the firm's entry strategy. Consistent with Fee's (2002) findings, we will assume that such entrepreneurs care about the quality of the products they offers, and so product quality enters into the entrepreneur's utility function. Consequently, such entrepreneurs will have incentives, in addition to the profit potential, to serve the high-quality segment of the market.

To enter this market segment, the entrepreneur's firm must signal its commitment to provide customers with a quality product through some type of costly commitment. One way of achieving this end is by having the entrepreneur retain a significant portion of the firm's equity or, put differently, to use less outside equity. This is a costly

step and therefore, it is an effective commitment to deliver a quality product. A failure to deliver would result in a substantial loss of the wealth of the major shareholder. This commitment may be especially important for manufacturing firms that supply inputs to other manufacturers. Final assemblers are likely to bear the initial brunt of consumer dissatisfaction with products that have poor quality components. A recent example for this situation is the Ford and Firestone tire controversy. In May 2000, the US National Highway Traffic Safety Administration contacted Ford and Firestone about the high incidence of tire failure on Ford Explorers fitted with Firestone tires. Ford investigated and found that several models of Firestone tires had very high failure rates. Furthermore, such commitments to high quality are easily signalled to potential customers. For example, the convention of naming the company after its controlling manager or shareholder is a simple and cost-effective way of signalling this commitment because only a controlling shareholder is likely to be able to name the firm in this way. The implication of this proposition is that entrepreneurs entering the high-end of the target market will need to retain more equity in their firm than an entrepreneur entering the low-end of the target market does.

Having decided how much outside equity is required to fund the firm's entry into or to sustain the firm's position within the high-quality segment of the target market, the entrepreneur faces the question of how much debt to use. Several product market considerations indicate that the firm should use relatively less debt than its competitors do. First, there is the effect of financial distress on the firm's ability to maintain its reputation for product quality (see Maksimovic and Titman, 1991; Titman, 1984). Second, there is the effect of firm leverage on its input choices. Kim and Maksimovic (1990) provide a model and evidence, which suggests that firm leverage can lead to input misallocation, which, in turn, is inconsistent with the firm's pursuit of product quality. Finally and more importantly is the effect of leverage on a firm's ability to deter new entrants.

Serving a less price-sensitive segment of the market generally means higher profit margins. Depending on the size of the market segment the firm serves, higher margins might attract other firms also interested in serving the same market segment. To deter such entry, the firm may have to commit credibly to strategies such as aggressive price-cutting in the face of increased competition. The more equity and less debt the firm has on its balance sheet, the lower it can cut its prices if this action is required. Therefore, the firm can reduce its profit margins without increasing the likelihood of bankruptcy. Consistent with this line of argument, Zingales (1998) provides evidence about the role of financial slack in the survival of US trucking firms after deregulation while Campello (2003) provides evidence on the changes in a firm's market share over the business cycle and its relationship to the firm's use of leverage prior to these cycles.

Further, as we have argued that management will own a significant block of their firm's stock, they can engage in such a battle, with its attendant temporary loss of profitability, without significantly increasing the probability of removal by outside shareholders. Thus, concentrated managerial shareholdings and financial slack not only signals the firm's commitment to offering a quality product, but also signals its capacity to fight off potential entrants into its market segment. In fact, neither concentrated managerial shareholdings nor financial slack alone allow firms to be as aggressive in protecting or expanding their markets. For this reason, we view concentrated managerial shareholdings (relatively lesser use of outside equity) and the maintenance of financial slack (relatively lesser use of debt) as complementary financing strategies to support a product market strategy focused on high profit margins.

These strategies also imply that low-leveraged closely controlled firms serving high-quality segments of their markets will tend to be smaller and more focused than other firms are. There are at least three reasons for these tendencies. First, the scope of the market segment it serves may limit the firm's size. Second, in order for the firm to maintain its reputation for product quality it must continue to invest more heavily in advertising, packaging, new product development and the like and so limit its funds for diversifying acquisitions. Finally, and most importantly, to maintain concentrated managerial ownership and lowered debt use, the firm limits its ability to raise outside funding to acquire other firms. Consequently, we expect our firms to be smaller and more focused, or less diversified, than other corporations.

The above arguments do not suggest that there are no limits to such strategies or that other considerations do not come into play in some of these firms. For example, as more and more of management's wealth becomes tied up in their firm, the incentive to maintain the firm's product market focus will likely be reduced. One reason for this is that management's personal wealth becomes more exposed to unsystematic risk because of having an undiversified portfolio (Amihud and Lev, 1981). Consequently, we anticipate that there is a level of managerial shareholdings beyond which the costs to management of concentrated shareholdings begin to outweigh the benefits. At such a point, firms will begin to reduce their focus and diversify their investments. Further, the confluence of concentrated managerial shareholdings, the possession of some degree of market power (e.g. the ability to maintain higher mark-ups) and the relatively lesser use of leverage allow such managers to become sufficiently insulated from market discipline (whether from the market for corporate control or from product market competition) that they may become lax in their management of their firm. Hicks (1935) pointed out there may be no greater monopoly benefit than that of a "quiet life". Interestingly, this benefit presumes that such managers are entrenched, which indicates a private benefit of control that is available in these circumstances, even in the USA.

Consequently, we can see that firms in which management possesses more than the average portion of their firm's stock will represent a mixture of firms, some for which competitive motivations dominate and others for which private motivations dominate. Nevertheless, we expect competitive motivations to be dominant in cross-sectional analyses of publicly traded firms, as the domination of private motivations will tend to be more path-dependent. For example, when control of a firm passes from the founder to the founder's offspring or other "members" of the family, the motivations of management can change to emphasize private benefits. More importantly, as Halpern *et al.* (1999) point out, when such private concerns begin to dominate, these firms have incentives to go private through management buyouts. Consistent with their argument, Halpern *et al.* (1999) provide evidence that a substantial proportion of firms that engage in a levered buyout (LBO) are firms in which management had a controlling interest prior to the buyout and the firm was experiencing poor stock returns. Thus, such firms do not tend to persist as publicly traded firms. To test the strength of some of these arguments, we have organized the paper to provide an overview of our sample, sources of data and the variables. This is followed by the analysis of data and a summary of the key findings.

#### *Data and variable definitions*

The study focuses on US manufacturing firms that operated during 1992. The reason for focusing on 1992 is that this is the most recent year for which the Bureau of Census provided market size and concentration estimates for four-digit manufacturing

Standard Industrial Classification (SIC) industries, which are important for some of our subsequent analyses. We further reduced our sample to those firms examined by Anderson and Lee (1997) because they collected detailed stock ownership information for firms with Compustat (a resource for in-depth financial information on publicly traded companies in the USA and around the world) data and provided these data for this study. Finally, we eliminated firms with more than one class of common stock, each with different voting rights (e.g. dual class firms), because our arguments focus on the wealth loss exposure associated with concentrated managerial shareholding and not on the possession of control absent a large amount of wealth at stake. These filters resulted in a sample of 522 manufacturing firms with positive sales during 1992 for which we have detailed ownership and Compustat data.

This screening process enabled us to supplement the Anderson and Lee (1997) data set with variables created from Compustat and Bureau of Census data. Based upon these data, we created a number of variables. We will discuss our primary variables below and our secondary variables as they are introduced for the purposes of a particular analysis.

*Product quality variables.* The most critical element of the study is concerned the product market strategy of the sample firms. Unfortunately, there are no publicly available direct measures of either a firm's product quality or its reputation for product quality. Consequently, we devised an indirect measure.

Following the above discussion, we imagined that firms faced two types of consumers: those that were cost-conscious and therefore, price-sensitive and those that were quality-conscious and consequently less price-sensitive. If this characterization is a reasonable approximation, then we might use a firm's relative price-cost margin to develop an indirect measure of the market segment the firm seeks to serve. Martin (1993), for example, shows that the first-order condition for profit maximization for a firm producing a differentiated product is:

$$\frac{p - MC}{p} = \frac{(1 - \theta\lambda_i)s_i}{\varepsilon_{edi}},$$

where  $p$  is the product's price,  $MC$  is the firm's marginal cost of producing the product,  $\theta$  is the degree to which the firm's product is differentiated from other products in its market,  $\lambda_i$  is firm  $i$ 's conjectural elasticity parameter,  $s_i$  is the firm  $i$ 's market share and  $\varepsilon_{edi}$  is the price elasticity of effective demand for the firm's product. What this condition implies is that a firm's price-cost margin should be inversely related to the price sensitivity of demand for its product. In other words, firms facing less price-sensitive consumers should be able to charge higher prices and thereby have higher profit margins, all other things held equal.

We assume that such a relationship is approximately correct and use Compustat data on the sales and cost-of-goods-sold for each of our sample firms to construct an approximation of their price-cost margin using their operating profit margin (i.e.  $pm = [\text{sales} - \text{cost-of-goods-sold}]/\text{sales}$ ). Rather than  $pm$ , however, we use  $\ln(pm)$  as our first product quality variable since its distribution more closely approximates a normal distribution.

Since the structure of a product market can affect the profit margins of firms operating within it, we view an industry-adjusted measure as a better measure of whether a firm is serving the upper segment of their market. Thus, we compute the median of this measure for each sample firm's primary industry, which is identified by

the firm's primary four-digit SIC. We then create the industry-adjusted pm, defined as:

$$\ln\left(\frac{pm_{firm}}{pm_{industry}}\right) = \ln(pm_{firm}) - \ln(pm_{industry}).$$

Finally, we create a dummy variable that takes on the value "1" if the sample firm's pm exceeds the median pm of its primary industry (zero otherwise). We create this categorical variable because it is not clear whether the magnitude of the difference matters as much as the direction of the difference. One reason for this is that these margins are likely to change from year to year, and so reflect business cycle factors as well. Consequently, absolute differences for any given year may be misleading, whereas relative differences are potentially more informative, particularly for our purposes.

The summary statistics in Table I give some sense of the variation in firm profit margins across industries with varying degrees of industrial concentration. There, we sorted our sample firms by the Herfindahl-Hirschman Index (HHI) of their respective four-digit SIC industries. HHI is a measure of the size of firms in relationship to the industry and an indicator of the amount of competition among them. It is defined as the sum of the squares of the market shares of each individual firm. Next, we examined the empirical distribution of the HHI of our sample firms industries'. We then broke this distribution into quartiles and examined the mean, median and SD of profit margins for firms within these quartiles.

There are three interesting points suggested by the statistics in Table I. First, most of our sample firms operate within relatively unconcentrated industries. Second, the relationship between industry concentration and the average profit margins of firms operating within these groupings is not particularly pronounced. There is, however, a large variation in the profit margins of firms within each of these quartiles. This last point is the most important as it suggests that we might be able to pick up the effect of product market positioning on our sample firms' financial and ownership structures.

*Ownership variables.* We focus on the fraction of stock held by officers and directors since this group represents the effective management team of a public corporation in a broad sense, and since our arguments are focused on firms with concentrated managerial shareholdings. There is no standard in the literature regarding the particular level of officer and director shareholdings that is required to establish concentrated managerial shareholdings or effective managerial control. La Porta *et al.* (1999) in their study of corporate ownership around the world use managerial holdings of 10-20 per cent as benchmarks of managerial control. Weston (1979) reports evidence that firms in which management owns at least 30 per cent of their firm's stock can ward-off unwanted takeover attempts. Consequently, we use benchmarks of 10, 20 and

	15 < HHI ≤ 333	333 < HHI ≤ 481	481 < HHI ≤ 901	901 < HHI ≤ 2922
Mean	0.400	0.319	0.326	0.306
Median	0.384	0.285	0.298	0.301
SD	0.148	0.230	0.160	0.140

**Notes:** The HHI of the primary industry of each sample firm was identified from US 1992 Census data. We subsequently sorted these data into four quartiles and report the mean, median and SD of firm profit margins within these sample quartiles

**Table I.**  
Distribution of firm  
profit margins by  
concentration of industry



30 per cent to identify possible threshold levels of concentrated managerial shareholdings. There are 178 firms in our sample with management teams that own 10 per cent or more of their firms' stock, 100 firms in which management owned 20 per cent or more, and 43 firms in which management owned 30 per cent or more.

*Firm financing variables.* We focus on our sample firms' long-term financing mix because Maksimovic and Titman's (1991) model appears to focus on a firm's long-term financing. We measure a sample firm's use of leverage as the ratio of its long-term debt to the sum of its long-term debt and the market value of its common stock. We call this ratio "Debt".

While we created a number of alternative measures, we focus on this one because it was used in Rajan and Zingales (1995). This is important because we use their study for identifying what factors we should control for in our analysis and for providing a benchmark by which to judge our evidence.

*Firm diversification measures.* Following Denis *et al.* (1997), we use two measures of a firm's diversification. First, we use the number of its distinct business segments, as reported in Compustat. Second, we calculate a firm Herfindahl-Hirschman Index (firm HHI) by using a firm's sales in each of its segments. We deviate somewhat from Denis, Denis and Sarin – as do the US Department of Justice and most industrial economists – by calculating this measure in percentages rather than fractions. Thus, the larger our measure of a firm's HHI, the more concentrated its operations.

#### *Basic sample statistics*

Before we begin our formal analysis, we perform a series of simple *t*-tests for the differences between firms operating in the higher end and firms operating in the lower end of their respective markets. Specifically, we use our product quality dummy variable to sort our sample into two groups: the pm of a firm serving the high end of its market exceeds its industry's median pm and the pm of a firm serving the low end of its market falls below its industry's median pm. We then examine the concentration of managerial shareholdings, the use of long-term debt financing, and the degree of diversification of the respective high-end/low-end groupings. The results of these simple *t*-tests are reported in Table II. Generally, the relative magnitudes of these variables and their differences are in accord with our arguments. However, rather than

	Firms operating in the lower segment of their market	Firms operating in the upper segment of their market	<i>p</i> values for unpaired <i>t</i> -test of difference
Mown	9.31	12.21	0.009
Debt	0.219	0.189	0.07
Number of segments	2.05	1.88	0.17
Firm HHI	7,615.54	8,100.05	0.04
Number of firms	264	258	522

**Notes:** The sample was sorted according to whether a sample firm's profit margin exceeded the median profit margin of its respective industry (four-digit SIC definition). "Mown" represents the percentage of the firm's stock held by officers and directors. Debt represents the proportion of its long-term financing accounted for by debt. Firm HHI represents a measure of how focused the firm's operations are using its sales in its different business segments

**Table II.**

Basic summary statistics

conclude much from this evidence, we turn to our multivariate regression analyses as these allow us to control for other influences.

## Analysis

### *Analysis of managerial ownership*

Our first argument is that managers have an incentive to own more of their firm's stock in order to commit credibly to serving the higher end of their respective markets. Thus, we expect the fraction of stock held by officers and directors to vary positively with the indicators of the firm's product quality.

Before we can arrive at such a conclusion, we must control for other potential influences on the concentration of managerial shareholdings. For this purpose, we use Demsetz and Lehn's (1985) study as our benchmark. Specifically, we use the regression specifications reported in Table V of their paper as our guide for such control variables. Since we are focused only on manufacturing firms, we do not need their dummies for special industries (e.g. media). As Demsetz and Lehn's (1985) did, we use the market value of a sample firm's equity as our firm size variable. We also use the natural logarithm of equity, as we are concerned with scale effects. To capture the control potential motive for concentrated shareholdings, we use the market model residuals, as they did to capture firm-specific risk and call this variable *frisk*. Specifically, we measure a firm's systematic risk by its beta, derived by fitting a market model to the firm's 1991 daily returns using the equally weighted index of all Center for Research in Security Prices listed firms as the market index. A firm's firm-specific risk is proxied by the standard deviation of that firm's market model residuals.

Before we examine the regressions reported in Table III, it is important to note that we use a different regression model than used in prior research. Specifically, we use the quasi-likelihood approach developed in Papke and Wooldridge (1996) for fractional variables. Ownership variables are fractional variables, though sometimes reported as

Constant	-2.208 (0.00)	-0.105 (0.81)	-0.150 (0.76)	-0.627 (0.24)	-0.332 (0.48)
Equity	-0.0001 (0.02)				
Ln(equity)		-0.310 (0.00)	-0.304 (0.00)	-0.265 (0.00)	-0.300 (0.00)
Firm risk	9.166 (0.66)	-5.918 (0.74)	6.245 (0.73)	-3.411 (0.87)	-3.240 (0.86)
(Firm risk) <sup>2</sup>	96.090 (0.73)	78.491 (0.74)	-90.47 (0.71)	193.75 (0.87)	43.009 (0.85)
Ln(pm)			0.132 (0.09)		
Industry adjusted pm				0.251 (0.03)	
Dummy = 1 if firm pm > Industry median pm					0.214 (0.05)

**Notes:** The dependent variable in each of the above regressions represents the fraction of a firm's stock held by its officers and directors. Equity represents the market value of the firm's stock. Firm risk represents the SD of the residuals of a market model fitted for each firm. Ln (pm) represents the natural logarithm of a firm's profit margin. Each regression was estimated using Papke and Wooldridge's (1996) quasi-likelihood approach. *P*-values associated with the null that the coefficient is 0 are reported within the parentheses below the coefficient estimates

**Table III.**  
Analysis of managerial  
ownership concentration



percentages. As demonstrated in Kieschnick and McCullough (2003), such variables are not censored or logistic normally distributed as presumed in some prior literature. Rather, as Papke and Wooldridge (1996) point out, the conditional expectation function of such variables must be a nonlinear function and the conditional variance will depend upon the conditional mean (hence, conditional heteroskedasticity is a problem). Because of the evidence reported in Kieschnick and McCullough (2003) on the various alternative regression models for these data, we use the quasi-likelihood model of Papke and Wooldridge (1996) for our data analysis.

The critical implication of these considerations is that the statistical analysis reported in Demsetz and Lehn (1985) and similar studies, is suspect. Consequently, we begin our analysis by reporting in Column 2 of Table III, our replication of Demsetz and Lehn's (1985) primary specification. Interestingly, we do not find evidence, as they did, that the control potential motive is an important influence on the fraction of stock held by management since the firm-specific risk variables are insignificant. This evidence raises questions about their findings, since as just noted, their evidence is based upon a questionable regression model.

In Column 3 of Table III, we report the results of a slightly different specification – this one using  $\ln(\text{equity})$  rather than equity – as specification analysis suggested this as a better specification of this particular regressor. Using these results as our benchmark, we then report in Columns 4-6 the results from incorporating different product market segment proxies, including  $\ln(\text{pm})$  and industry-adjusted pm variables, into this basic specification. The implication of these results is that firms with greater profit margins relative to their industries tend to have management teams that own a greater proportion of their firm's stock. This evidence is consistent with our argument that managers of firms serving the more quality-conscious or less price elastic, segment of their markets will have incentives to own a greater fraction of their firm's stock.

#### *Analysis of financing strategies*

Our second argument is that firms that serve the quality-conscious, or less price-sensitive, segment of their markets will have incentives to use relatively less debt. Hence, we expect firm leverage to vary negatively with proxies for the firm's product market strategies. Again, before we can reach such a conclusion, we need to control for other factors that influence a firm's debt load choice. As noted earlier, we use Rajan and Zingales (1995) to identify such controlling factors.

Specifically, we use the regressors specified in their basic regression model: tangibility, market-to-book, logsale and profitability. They define tangibility as the ratio of fixed assets to the book value of total assets; market-to-book as the ratio of the book value of assets less the book value of equity plus the market value of equity all divided by the book value of assets; logsale as the logarithm of net sales; and profitability as EBITDA divided by the book value of assets (i.e. return on assets).

Before we discuss the results of our regression, we again note that we are using a different regression model than used in prior research. Our capital structure variable, "Debt", is a fractional variable, like most capital structure variables tend to be. Thus, we again use Papke and Wooldridge's (1996) quasi-likelihood regression model for these data, for the same reasons given earlier.

We begin our analysis by reporting in Column 2 of Table IV the results of fitting the Rajan and Zingales (1995) specification. Our results differ from the results they report for the USA in Table IX of their paper. We do not find that the tangibility of a sample

firm's assets is a significant influence on the firm's use of leverage. Whether this is due to differences in our samples or regression models is unclear. For example, we have examined only manufacturing firms, so it is possible that we do not observe enough variability in this measure across firms to discern its effect. Regardless, we will simply use our reported results as our benchmark.

While Rajan and Zingales (1995) did not interpret their profitability measure as a product quality measure, Hawawini and Viallet (1999) report evidence of a positive correlation between a firm's profitability and its customers' evaluation of its reputation for product quality using Profit Impact of Market Strategy data. Thus, the negative sign of the coefficient of their profitability variable is consistent with our hypothesis.

Nevertheless, we refine our analysis by substituting our different product quality proxies for Rajan and Zingales' (1995) profitability measure. The results, reported in Columns 3-5 of Table IV, are consistent with our hypothesis, and suggest that profitability measures may be capturing information on where a firm locates in its product market. Further, we view our evidence as confirming the inference drawn in Titman and Wessels (1988) of an inverse relationship between product quality and firm leverage.

#### *Analysis of firm diversification*

Our final argument is that concentrated managerial shareholdings and the reduced use of leverage are found in firms that are more likely to be smaller and more focused, or less diversified, than other firms unless management's undiversified risk begins to dominate their concerns. To conduct our tests, we examine the two measures of a sample firm's diversification defined above, the number of segments in a firm and the firm's HHI.

Since our first measure is a count variable, we use the negative binomial regression model for these data. We use the negative binomial rather than the Poisson regression model to allow the variance to deviate from the mean. Further, since our firm HHI is a

Constant	-0.896 (0.00)	-2.266 (0.00)	-1.759 (0.00)	-1.885 (0.00)
Tang	0.342 (0.81)	0.243 (0.41)	0.431 (0.21)	0.577 (0.15)
Market to book ratio	-0.262 (0.00)	-0.305 (0.00)	-0.373 (0.00)	-0.293 (0.00)
Ln(sales)	0.115 (0.00)	0.142 (0.00)	0.136 (0.00)	0.140 (0.00)
Profitability	-2.023 (0.00)			
Ln(pm)		-1.403 (0.00)		
Industry-adjusted pm			-0.603 (0.01)	
Dummy = 1 if firm pm > industry median pm				-0.136 (0.05)

**Notes:** The dependent variable in these regressions is the proportion of a firm's long-term financing accounted for by its debt financing (debt). Tang represents the proportion of a sample firm's total assets accounted for in fixed assets. Market to book ratio is the ratio of the market value of the firm's equity to the book value of its equity. Profitability is the ratio of a firm's EBITDA to its book value of assets. Each regression was estimated using Papke and Wooldridge's (1996) quasi-likelihood approach. *P*-values associated with the null that the coefficient is 0 are reported within the parentheses below the coefficient estimates

**Table IV.**  
Analysis of financial  
structure

non-negative variable, we assume that it is conditionally distributed as a lognormal random variable and so use the natural logarithm of our firm HHI as our dependent variable.

The results of estimating these two sets of regressions are reported in Table V. The results for either measure of firm diversification/focus are quite similar. First, the results suggest that the more stock management holds in the firm, the more focused, or less diversified, the firm tends to be. The evidence further suggests a nonlinear relationship between firm focus and managerial equity, evidence that is consistent with the argument that managers who own too much of their firm's equity have a tendency to use the firm to diversify their portfolios. Interestingly, our evidence is consistent with that reported in Denis *et al.* (1997), who also find that firm diversification is concave in managerial shareholdings. However, our earlier arguments explain why one might observe such a nonlinear relationship, which is unexplained in their paper. Our story also provides a rationale for why they observe the applicability of Amihud and Lev's (1981) argument only when management's stake exceeds a certain level.

### Summary

We argue that concentrated managerial shareholdings (i.e. lesser use of outside equity) and financial slack (i.e. lesser use of debt) are complementary strategies for a firm that is interested in emphasizing product quality and/or firm reputation as its product market strategy. Further, because of these strategic commitments, these firms will tend to be smaller and more focused, or less diversified, than other firms are.

	Number of segments					Ln (firm HHI)				
Constant	0.730 (0.00)	0.713 (0.00)	0.684 (0.00)	0.647 (0.00)	0.774 (0.00)	8.862 (0.00)	8.869 (0.00)	8.882 (0.00)	8.907 (0.00)	9.468 (0.00)
Tassets	9.896 (0.00)	9.896 (0.00)	10.133 (0.00)	10.434 (0.00)	9.475 (0.00)	-9.708 (0.00)	-9.785 (0.00)	-9.982 (0.03)	-10.389 (0.00)	-9.468 (0.00)
Mown	-0.950 (0.00)				-1.887 (0.00)	0.489 (0.00)				0.838 (0.00)
Mown > 10%		-0.252 (0.00)					0.133 (0.00)			
Mown > 20%			-0.300 (0.00)					0.171 (0.00)		
Mown > 30%				-0.180 (0.15)					0.113 (0.11)	
Mown *Mown					2.054 (0.05)					-0.721 (0.10)

**Notes:** The dependent variable in the first five regressions is the number of segments of each sample firm and is estimated as negative binomial regression models. The dependent variable in the second five regressions is the natural logarithm of a firm's HHI based upon its sales in each of its different business segments (if any). Tassets represent a sample firm's total assets, a firm size proxy, scaled by 106. Mown represents the percentage of a firm's shareholdings (votes) held by the officers and directors. Mown > 10 per cent, Mown > 20 per cent and Mown > 30 per cent represent dummy variables that take on the value 1 when Mown exceeds 10 per cent, 20 per cent and 30 per cent, respectively. *P*-values associated with the null that the coefficient is 0 are reported within the parentheses below the coefficient estimates. SEs were estimated using Huber's robust SE estimators for the first five regression models, and were estimated using White's heteroskedasticity – consistent covariance matrix estimator for the second five regression models

**Table V.**  
Analysis of firm  
diversification

However, we also argue that there are limits to this strategic approach as management's equity stake in their firm increases. At some point, which will differ by firm, managerial wealth tied up in their firm becomes a more pressing determinant of their incentives, especially if they do not face market discipline. In these circumstances, management will have incentives, for example, to diversify the firm's operations to reduce their unsystematic risk exposure or to take their firm private through a LBO.

Consistent with these arguments, we find three patterns in the data for a sample of manufacturing firms operating during 1992. While controlling for other relevant factors, we first find that various proxies for a firm's product market strategy are positively correlated with the fraction of a firm's stock held by management. Second, we find that these same product market proxies are negatively correlated with the sample firms' use of leverage. Third, we find, controlling for firm size, that firm focus is concave in managerial shareholdings. We interpret this last piece of evidence as suggesting that management's undiversified risk concerns begin to influence their decision-making at some point, and reduce their incentives to maintain firm focus.

We think that our arguments and evidence are interesting for three important reasons. First, while prior literature has tended to focus on the variation in corporate capital structures across industries, MacKay and Phillips (2005) provide evidence that there is substantial variation in corporate capital structures within an industry. While they focus on a firm's technology choices, and we focus on a firm's product market strategy, we do not consider these views as necessarily conflicting. As a result, we think that we provide a path towards understanding such intra-industry variation. Nevertheless, we recognize that additional research on such intra-industry variations is warranted.

We also think that we contribute to the literature on the determinants of corporate ownership structures. Not only do we provide evidence that suggests some of the inferences drawn in Demsetz and Lehn (1985) need to be re-examined, but we have also identified another influence on such structures, one that is motivated by competitive considerations rather than the more narrow private benefits of control. Consequently, we provide a rationale for why concentrated managerial shareholdings may not simply be indicative of the managerial pursuit of private benefits.

Finally, we suggest that our arguments and evidence, taken together, provide an explanation of why prior research has found that so called "all equity" firms tend to be distinguished by large management shareholdings (e.g. Agrawal and Nagarajan, 1990). In fact, one such firm, Microsoft Corporation may provide one of the best examples of our argument on why concentrated managerial shareholdings and financial slack facilitate an aggressive approach to protect a firm's margins. However, since Microsoft is a software firm, this example also serves to highlight the need for future research into the generalizability of our arguments to other types of industries.

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