



## MANAGERIAL OWNERSHIP AND CORPORATE DIVERSIFICATION: A LONGITUDINAL VIEW

MARIA GORANOVA, TODD M. ALESSANDRI,\* PAMELA BRANDES and RAVI DHARWADKAR

*Martin J. Whitman School of Management, Syracuse University, Syracuse, New York, U.S.A.*

*Strategy and finance research suggests that managerial ownership results in increased incentive alignment and therefore is negatively related to corporate diversification. Using a longitudinal approach, we develop arguments to examine whether managerial ownership is associated with subsequent changes in diversification and/or if diversification is associated with subsequent changes in ownership. The results indicate that levels of managerial ownership in one time period are not associated with subsequent changes in corporate diversification, which raises incentive alignment questions. We also find that higher levels of corporate diversification are associated with changes in managerial ownership, which suggests support for the employment risk-reduction perspective. This study provides important reasons to reassess the longitudinal implications of the managerial ownership–corporate diversification link from both theoretical and managerial perspectives.* Copyright © 2007 John Wiley & Sons, Ltd.

The percentage of managerial ownership has increased between 1935 and 1995 in the United States, with managerial ownership in large corporations representing an important potential incentive alignment mechanism (Holderness, Kraszner and Sheehan, 1999; Morck, Shleifer, and Vishny, 1988). From an agency theory perspective, managerial ownership is associated with value-enhancing decisions by managers on behalf of the owners. Most research examining the managerial ownership–corporate diversification link assumes that high managerial ownership promotes incentive alignment and thus is negatively associated with value-reducing strategies like corporate diversifica-

tion (Lang and Stulz, 1994; Loderer and Martin, 1997). The findings of Denis, Denis, and Sarin (1997) support this view and offer evidence of a negative association between managerial ownership and corporate diversification.

The purpose of this study is to reexamine the managerial ownership–corporate diversification linkage for two reasons. First, from a corporate governance perspective, both research and practice suggest that owners' and boards' encouragement of managerial ownership is appropriate because managerial ownership reduces corporate diversification and avoids shareholder value destruction (Berger and Ofek, 1995; Denis *et al.*, 1997; Lang and Stulz, 1994). Managerial ownership, by constraining diversification, can also prevent the need for restructuring that often results from overdiversification (Johnson, 1996; Markides, 1995). However, the research advancing this general hypothesis takes a cross-sectional approach while explicitly drawing causal inferences in which managerial ownership precedes corporate diversification.

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\* Correspondence to: Todd M. Alessandri, Martin J. Whitman School of Management, Syracuse University, 721 University Ave., Syracuse, NY 13244-2450, U.S.A.

E-mail: [tmalessa@syr.edu](mailto:tmalessa@syr.edu)

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For example, Denis *et al.* (1997) use managerial ownership data from a December 1984 proxy statement and calculate corporate diversification ratios using Compustat data from 1985. More recent theorizing by Lubatkin, Lane, and Schulze (2001) implicitly assumes that executive ownership precedes organizational diversification strategies.

Consequently, we believe it is important to examine whether managerial ownership in one time period is associated with changes in diversification in a subsequent time period. Most prior research assumes that increased executive ownership will increase incentive alignment and therefore affect subsequent diversification. As suggested by Bergh and colleagues, the choices associated with different techniques 'can lead to variation in empirical results and lead to different conclusions for theory development' (Bergh, 1995; Bergh and Holbein, 1997). For example, Bergh (1995) demonstrates that the diversification–performance relationship is contingent on whether data are cross-sectional or longitudinal. By considering longitudinal aspects of the executive ownership–diversification relationship from an incentive alignment perspective, we attempt to determine whether relationships found in cross-sectional analyses persist dynamically over time.

Second, this study questions the conventional wisdom that managerial ownership is solely an incentive alignment tool in the context of corporate diversification and that ownership necessarily precedes diversification. We test alternatives to incentive alignment-based explanations regarding why diversification may actually influence managerial ownership, consistent with the longitudinal and reciprocal aspects of this relationship (Chang, 2003; Cho, 1998). Recent ownership research findings suggest that ownership variables not only influence firm-level factors but that, in turn, these firm-level factors influence aspects of organizational ownership (Chang, 2003). Therefore, firms' diversification postures may actually precede managerial ownership changes, such that executives in diversified firms may be more willing to bear risk than their counterparts in focused firms (Eisenmann, 2002); alternatively, executives in diversified firms may increase their ownership positions as a signal or to bond themselves to owners. Thus, changes in managerial ownership structures may respond to corporate diversification from either an employment risk-reduction perspective or a market signaling perspective. This possibility has

not been explicitly considered due to an overemphasis on incentive alignment arguments, which highlights the need to reexamine previous ownership–diversification assertions in a longitudinal context to examine potential bidirectional influences over time.

Consequently, this research provides a different view of the managerial ownership–corporate diversification link, having the potential to make two important contributions. First, our longitudinal reassessment offers the chance to examine the degree of consistency between cross-sectional and longitudinal perspectives in their support of managerial ownership as an incentive alignment tool to constrain diversification. Second, we propose a novel theoretical perspective of the ownership–diversification link, i.e., the existence of a reciprocal relationship where diversification precedes rather than follows managerial ownership.

## THEORETICAL FRAMEWORK

### Cross-sectional research on the ownership–diversification linkage

Traditional agency theory research assumes that risk-neutral owners (principals) must encourage risk-averse managers (agents) to act in the interests of those owners by either monitoring managers (and incurring monitoring costs) or increasing incentive alignment through instruments such as managerial ownership, stock options, and the like (Beatty and Zajac, 1994; Jensen and Meckling, 1976; Tosi, Katz, and Gomez-Mejia, 1997). In response, managers must incur bonding costs to convince owners that they are acting in the owners' best interests (Barney and Hesterly, 1999; Jensen and Meckling, 1976). Despite these costs, the parties' interests are seldom aligned perfectly, resulting in leakages called 'residual losses' (Fama and Jensen, 1983; Jensen and Meckling, 1976).

Various studies have examined the agency theory implications of ownership structures for corporate diversification from monitoring and incentive alignment perspectives. Finance and management scholars, using a cross-sectional perspective, agree that ownership structures influence corporate strategies such as diversification and that diversification results in a general discount for the diversifying firms' value in comparison with the aggregate value of similar independent firms (Amihud and Lev, 1981; Berger and Ofek, 1995;

Denis *et al.*, 1997; Hoskisson, Hill, and Kim, 1993; Lang and Stulz, 1994). More specifically, given the assumption that diversification is a value-reducing strategy, researchers contend that concentrated ownership by outsiders leads to effective monitoring and constrains managers from pursuing the value-reducing activities they favor because of their risk aversion (Amihud and Lev, 1981).

In addition, an emerging consensus suggests that diversification also reduces executive employment risk (e.g., job loss, professional reputation, loss of compensation) by making managers less vulnerable to the vagaries associated with any specific line of business (Amihud and Lev, 1981; Hoskisson and Hitt, 1994). Furthermore, in the absence of concentrated ownership, managers may use their discretion and redirect the firm's free cash flows to acquire firms that increase their diversification and reduce risk (Amihud and Lev, 1981).

Therefore, researchers have explored how managerial ownership increases incentive alignment and is associated with managerial actions consistent with owner preferences. The relationship is based on the critical argument that higher levels of ownership lead to increased incentive alignment and are associated with lower levels of corporate diversification<sup>1</sup> (Agrawal and Mandelker, 1987; Amihud and Lev, 1999; Denis *et al.*, 1997, 1999). Research in management bolsters these arguments by suggesting that, absent strong outside ownership, management may overdiversify the firm and suffer worse performance, consistent with the tenets of agency theory (Bethel and Liebeskind, 1993; Hoskisson, Johnson, and Moezel, 1994). For example, in reviewing literature on corporate refocusing (i.e., diversification reduction) during 1983–96, Johnson (1996) concludes that one of the major antecedents of refocusing is governance and that, consistent with an agency perspective, concentrated ownership curbs overdiversification. Markides (1995) echoes these sentiments, linking overdiversification to poor performance and the need for restructuring to improve

performance. The theoretical and practical implications of these arguments are very powerful; greater managerial ownership results in incentive alignment from a theoretical perspective, and therefore, in practice, outside owners should encourage managers to acquire ownership (Hoskisson and Hitt, 1994).

### **Longitudinal effects of managerial ownership on diversification**

According to previous cross-sectional results, managers should own more of their firms. In practice, we continue to observe an increase in managerial ownership, despite the use of alternate incentive alignment mechanisms such as stock options that purport to counteract the natural managerial tendency toward risk reduction (Amihud and Lev, 1999; Holderness *et al.*, 1999). Existing cross-sectional results pertaining to managerial ownership and diversification are strong, but the implications of this relationship have not been tested longitudinally. Cognizant of how variability in research designs and analytical decisions can lead to different conclusions, Bergh (1995) and Bergh and Holbein (1997) argue for the use of both cross-sectional and panel data to test whether empirical relationships should be viewed as static or changeable. In other words, it is essential to verify explicitly whether the implications of cross-sectional results are sustained over time. In this context, firms with lower managerial ownership should be associated with subsequent increases in diversification, and firms with higher executive ownership should be associated with subsequent decreases in diversification.

We use these insights in combination with the monitoring arguments of Bethel and Liebeskind (1993) to develop our first hypothesis, which offers us a chance to reexamine the managerial ownership and corporate diversification debate in this new light. Research on corporate diversification and refocusing suggests that in the absence of significant monitoring oversight by owners managers will pursue their self-interests and diversify their employment risk. Concentrated ownership in the form of blockholders solves some agency problems, as has been noted in various studies (Boyd, Gove, and Hitt, 2005; Hoskisson *et al.*, 1994; Johnson, 1996; Johnson, Hoskisson, and Hitt, 1993). For example, Bethel and Liebeskind (1993) find that blockholder ownership in

<sup>1</sup> Amihud and Lev (1999) acknowledge that, on one hand, low ownership results in high diversification. On the other hand, as managerial ownership increases, the free cash flow agency problem may be solved, but the high employment risk problem remains. Most researchers acknowledge this trade-off (i.e., managerial ownership and diversification relationship confounded by the opposing effects of incentive alignment and private benefits that arise from risk reduction due to entrenchment) but nonetheless conclude in favor of the incentive alignment hypothesis (e.g., Denis *et al.*, 1997).

one time period is positively related to subsequent decreases in firm diversification. If blockholders' monitoring postures in one period influence corporate diversification in subsequent periods, we expect similar effects for alternate mechanisms such as incentive alignment (e.g., managerial ownership). Similar to Bethel and Liebeskind's arguments, we propose that high managerial ownership should lead to lower levels of firm diversification in subsequent time periods. These arguments rest on two assumptions: (1) monitoring and incentive alignment are substitute governance mechanisms (Beatty and Zajac, 1994; Rediker and Seth, 1995; Tosi *et al.*, 1997; Zajac and Westphal, 1994); and (2) increases in managerial ownership reduce free cash flow problems and increase incentive alignment (Amihud and Lev, 1981). These arguments lead to the following hypothesis:<sup>2</sup>

*Hypothesis 1: Managerial ownership is negatively related to subsequent changes in corporate diversification.*

### Impact of diversification on managerial ownership

Limited research has examined the implications of diversification for managerial ownership, which represents an oversight because most cross-sectional research leads to the causal conclusion that managerial ownership influences diversification. Given that managers are risk averse and face higher employment risks than shareholders (whose risk is already diversified in their portfolios), researchers must examine how managers choose their ownership positions in response to the risk faced by the firm. Two theoretical perspectives suggest similar effects. First, from a behavioral agency perspective, if diversification is framed as a

risk-reducing strategy, managers should react positively and be willing to increase their ownership position because of the reduced risk the diversified firm offers (e.g., Wiseman and Gomez-Mejia, 1998). Second, from a signaling/bonding perspective, managers may be willing to signal to the markets that their diversification strategies are in the best interests of the owners and will result in positive outcomes. Therefore, managers who increase their ownership stakes in highly diversified firms may be signaling their optimism to the market. Unfortunately, research has not yet considered either of these possibilities.

We begin by briefly elaborating on the implications of the behavioral agency model for the effects of diversification on managerial ownership. Since Amihud and Lev's (1981) research, it has been widely accepted that the main managerial motive for diversification in the absence of meaningful monitoring by owners and boards is risk reduction. If we frame diversification as a risk-reduction exercise, managers want not only to reduce their employment risk by diversifying but also to react to the reduced risk in a *post hoc* manner. As Wiseman and Gomez-Mejia (1998) argue, the framing of the problem affects executive risk-bearing; when diversification is framed as a risk-reduction mechanism, managers may be willing to bear more risk through managerial ownership because of the trade-off with the reduced risk in the diversified firm. In the same spirit, Eisenmann (2002) reiterates the assumption that managers prefer to reduce the volatility of their personal incomes and thereby reaches the prediction that managers in diversified firms will be more willing to bear risk compared with their counterparts in focused firms. Nonetheless, Eisenmann (2002) only focuses on the cross-sectional relationship between CEO ownership and risk-taking propensity.

The behavioral agency arguments essentially cast ownership changes in terms of a response to reduced risk and, in that sense, as reactive. A second line of reasoning leads to a similar conclusion (i.e., diversification levels influence changes in ownership), albeit from a proactive perspective. Given that diversification in general is a value-reducing strategy, some diversified firms may outperform other diversified and non-diversified firms. If that is the case, managers of such diversified firms may proactively signal to the market their confidence in the firm in order to reduce information asymmetry between the manager and

<sup>2</sup> Our hypothesis is prefaced on linear effects over time between managerial ownership and diversification. Some scholars, beginning with studies by Morck *et al.* (1988) and including recent work by Wright and colleagues (2002), have found curvilinear effects of ownership. Hoskisson and Hitt (1994) identify this important issue and state that owner-managers who have a great deal of individual wealth invested in the firm and who lack personal portfolio diversification prefer higher levels of diversification. That is, as managerial ownership increases, so does the manager's employment risk; consequently, managers with high levels of ownership may actually prefer diversification in subsequent periods. Although we recognize trade-offs between incentive alignment and employment risks that might result in curvilinear relationships, previous research has mainly focused on the linear effects of ownership. However, we do conduct *post hoc* analyses that find no support for a curvilinear model.

stockholders. That is, managers, rather than being opportunistic, may try to communicate their optimism to shareholders by a signal that bonds managerial wealth to shareholder interests, which reduces information asymmetry (Eisenhardt, 1989; Jensen and Meckling, 1976; Sanders and Carpenter, 2003).

Change in ownership can be an effective signaling mechanism that provides information to shareholders who lack data and face uncertainty. Previous research indicates that signals can exist in the form of governance mechanisms (Sanders and Boivie, 2004) or stock repurchase announcements (Sanders and Carpenter, 2003). For a signal to be credible, it must be both observable and costly to imitate (Ross, 1977; Spence, 1973). In a diversification context, considerable uncertainty affects shareholders' valuation of the firm, because investors face informational disadvantages (Finkelstein and Boyd, 1998; Smith and Watts, 1992). For example, previous work suggests that diversification is a value-destroying activity, particularly if it is unrelated (Berger and Ofek, 1995; Denis *et al.*, 1997). However, recent finance work provides contradictory evidence, suggesting that a diversification premium actually may exist (Campa and Kedia, 2002; Villalonga, 2004a, 2004b). In such cases, managers want to legally communicate to shareholders the positive value implications of the diversification strategy. Managers can signal their optimism about their corporate diversification strategy by increasing their ownership. Changes in managerial ownership exemplify the criteria of observability and costliness, in that corporate filings must disclose these transactions. Thus, the behavioral agency theory and signaling theory arguments both suggest similar patterns of behavior, and we expect that diversification will lead to subsequent changes in managerial ownership.

*Hypothesis 2: Diversification is positively related to subsequent changes in managerial ownership.*

## RESEARCH DESIGN

### Data

We examine our hypotheses with longitudinal data from Standard and Poor's (S&P) 500 companies. The decision to focus on the S&P 500 was

influenced partly by the availability of data but also by the consideration that these are complex, visible firms with highly dispersed ownership. We obtained data for the period 1994–99 from ExecuComp and Compustat's Industrial Annual and Segments databases,<sup>3</sup> CDA/Spectrum Thomson Financial's 13F database, and Compact Disclosure annual tapes. Consistent with similar research, we eliminated utility and financial firms (Denis *et al.*, 1997). Furthermore, 30 firms had incomplete data in Compustat, and data for 94 firms were missing from the Compact Disclosure tapes. The final sample yielded an unbalanced panel dataset consisting of 961 firm-year observations, which consists of 231 firms. The final sample includes firms in 41 2-digit standard industrial classifications (SIC) and 125 4-digit SICs.

## Dependent and independent variables

### Executive ownership

We measure *executive ownership* as the percentage of shares outstanding owned by the CEO. As prior research has found, firm size and diversification are positively correlated (Denis *et al.*, 1997; Grant, Jammine, and Thomas, 1988), so a percentage stake in a diversified firm is likely to be more costly than a stake in a focused firm, *ceteris paribus*. Our use of percentage stake is warranted by the signaling theory proposition that the credibility of a signal is related to its cost<sup>4</sup> (Spence, 1973).

### Corporate diversification

We measure *diversification* with both the Berry-Herfindahl (Jacquemin and Berry, 1979) and entropy (Palepu, 1985) diversification indices, calculated using the reported company's sales in the Compustat Business Segment database. Because managers may believe that related and unrelated

<sup>3</sup> Data on executive ownership are available through EXECU-COMP from 1992; however, a substantial portion of the data are missing (i.e., 59% of the data are missing for 1992, 25% are missing for 1993), and we therefore excluded these years from the analysis.

<sup>4</sup> Spence (1973: 358) argues that a signal will not effectively distinguish one signaler from another unless the costs of signaling are negatively correlated with capability. Thus, capable managers who signal their abilities through increased ownership will find the signal less costly, because the likelihood of seeing their stock depreciating is smaller for more capable managers than for less capable ones, *ceteris paribus*.

diversification have different risk profiles (Boyd *et al.*, 2005), we separate total diversification (entropy) into its components: *related* (DR) and *unrelated* (DU) *diversification*.

### Control variables

Given the extensive literature on diversification, we need to control for numerous other variables in order to isolate the effects of our focal variables. Whereas some researchers have considered directors' ownership as managerial ownership (e.g., Denis *et al.*, 1997; Lloyd, Jahera, and Goldstein, 1986), these two groups typically are viewed as opposites in the principal–agent context, and therefore, executive ownership and ownership by outside directors may have different effects (Lane, Cannella, and Lubatkin, 1998; Morck *et al.*, 1988). In turn, we control separately for them.

Next, we control for *firm size* (using the natural logarithm of market value), which is related to many aspects of executive ownership and corporate diversification. On the one hand, larger firms may be more likely to grant stock options; on the other hand, ownership stakes will be proportionally more expensive in larger firms. Moreover, prior research (Grant *et al.*, 1988) has found that diversification is positively related to firm size.

We also controlled for *firm risk* (standard deviation of returns on assets (ROA) for the preceding 3 years) because higher variability increases the risk associated with the holding company's stock and might provide incentives for diversification. Furthermore, firm-specific uncertainty may affect the level of insider ownership (Cho, 1998).

Because prior research suggests that corporate diversification relates to a firm's debt usage (e.g., Amit and Livnat, 1988; Chatterjee, Harrison, and Bergh, 2003; Mansi and Reeb, 2002), we control for *financial leverage*. As a proxy for incentive compensation, we use the value of the CEO's *stock options*, scaled by the market value of the firm. Furthermore, Bigley and Wiersema (2002) suggest that newly appointed CEOs are more likely to be involved with organizational change efforts, such as corporate refocusing,<sup>5</sup> and CEOs with longer tenure are likely to have accumulated more

stock ownership, which necessitates our control for *change of CEO* during the year. We also control for *prior performance* (ROA), because research suggests that firms in nonperforming industries may choose to diversify (Bergh and Lawless, 1998).

We include additional controls for differences in corporate governance structures.<sup>6</sup> Prior research has indicated that various governance mechanisms may influence diversification and managerial ownership, so we obtain *CEO duality*, *board independence*, and *director ownership* data from Compact Disclosure annual tapes. CEO duality is a dummy variable coded as 1 if the firm's CEO also serves as chairperson of the board and 0 otherwise. Board independence represents the ratio of outside directors serving on the board. Director ownership, a proxy for board incentives to fulfill control responsibilities (Boyd, 1994; Shleifer and Vishny, 1986), reflects the percentage of outstanding shares owned by officers and directors; because we have already included executive ownership, we exclude the percentage of shares owned by the CEO from this measure.

Prior research has found that increased influence by the board of directors, as well as ownership concentration, is related to increased corporate refocusing (Bergh and Lawless, 1998; Bethel and Leibeskind, 1993; Johnson *et al.*, 1993). We control for the influence of *total institutional ownership* using the percentage of shares owned by institutional investors. The data were obtained from CDA/Spectrum Thomson Financial's 13F database. We controlled for the effects of *blockholders* by including a measure that aggregates only ownership stakes that represent at least 5 percent ownership in the firm. Finally, following Denis *et al.* (1997), we control for *industry membership* based on the main 2-digit SIC code of the company. We included dummy, or indicator, variables to reflect the 41 different 2-digit SIC industries in the sample. All control variables, with the exception of executive succession and industry dummies, are lagged one year.

### Model

To overcome the vulnerability to errors associated with testing change as a simple difference between two states, we followed Bergh and Fairbank's

<sup>5</sup> To the extent that corporate refocusing runs counter to the previous corporate strategy (Bigley and Wiersema, 2002) and newly appointed CEOs are less likely to have vested interests in the divisions, which are candidates for divestiture, controlling for executive turnover is warranted.

<sup>6</sup> We thank two anonymous reviewers for this suggestion.

(2002) components score analysis. This alternative to change scores avoids reliability concerns and minimizes the possibility of confounding the effects of the component measure; in addition, it provides a direct test of the components relative to the outcome variable (Bergh and Fairbank, 2002).

Unlike the simple difference approach, in which the difference in diversification between time periods 1 and 2 is regressed onto executive ownership during time period 1, the component measures approach regresses diversification in time periods 1 and 2 in separate models onto executive ownership in time period 1. To test our hypotheses, which involve dynamic relationships, we compare the regression coefficients of these two models to determine whether they trend in the hypothesized direction and if their difference is not equal to 0. We estimate the models for the two time periods by conducting ordinary least squares (OLS) on the pooled data. In the presence of autocorrelation, OLS is consistent but inefficient, so we also use the Newey-West correction on the standard errors (Greene, 2003). We test the difference in the coefficients for the two time periods with an *F*-test on the joint hypothesis involving the two models. Because the error terms of the two models that we apply to the dependent variable in time periods 1 and 2 are correlated, we estimate the variance-covariance matrix used in the test with seemingly unrelated regression, which uses generalized least squares to account for the correlated errors and leads to efficient estimates (Greene, 2003; Maddala, 2002).

## RESULTS

We present the means, standard deviations, and correlations among variables in Table 1. On average, the executive ownership in our sample is 1.73 percent (standard deviation (S.D.) 4.63), consistent with the CEO equity reported by prior research for a comparable sample (e.g., McGuire and Matta, 2003). Also as suggested by prior research, executive ownership is negatively related to corporate diversification ( $r = -0.18$ ,  $p < 0.001$ ).

In Tables 2 and 3, we present the results of our regression analyses, which we based on the technique recommended by Bergh and Fairbank (2002). In Table 2, the dependent variables, diversification in time periods 1 and 2, are regressed on the control variables and executive ownership

during time period 1. We repeat this analysis for total diversification, as well as for related (DR) and unrelated (DU) diversification. Consistent with prior research, firm size and financial leverage are positively related to diversification. As we show in Table 2, executive ownership coefficients do not change over time, despite being negatively and significantly related to the dependent variables for total and unrelated diversification. Specifically, we find that managerial ownership is negatively related to total diversification in both time period 1 ( $b = -0.005$ ,  $p < 0.01$ ) and time period 2 ( $b = -0.004$ ,  $p < 0.05$ ). However, the *F*-test comparing these two coefficients is not significant ( $F = 0.21$ ), which suggests that managerial ownership has no influence on subsequent diversification. We find similar results for unrelated diversification. Namely, managerial ownership is negatively related to unrelated diversification in time period 1 ( $b = -0.008$ ,  $p < 0.01$ ) and time period 2 ( $b = -0.007$ ,  $p < 0.01$ ), but the *F*-test comparing these two coefficients is not significant ( $F = 0.48$ ). We also find that managerial ownership is not significantly associated with related diversification. Therefore, we find support for the negative managerial ownership–diversification linkage reported in cross-sectional literature but not for our longitudinal test of this relationship, as stated in Hypothesis 1. Firms with higher executive ownership are not more likely to engage in subsequent reductions of corporate diversification, irrespective of the measure of diversification used.

In Table 3, we show that diversification, as we expected, is negatively related to executive ownership. The executive ownership dependent variable in time periods 1 and 2 is regressed on the control variables and three different measures of diversification. We find that total diversification is negatively related to executive ownership in both time period 1 ( $b = -1.332$ ,  $p < 0.01$ ) and time period 2 ( $b = -0.952$ ,  $p < 0.05$ ). The *F*-test comparing these two coefficients across models is significant ( $F = 3.75$ ,  $p < 0.05$ ), which suggests that diversification affects subsequent changes in executive ownership. We note similar results for unrelated diversification. Namely, unrelated diversification is negatively related to ownership in time period 1 ( $b = -1.097$ ,  $p < 0.01$ ) and time period 2 ( $b = -0.816$ ,  $p < 0.01$ ), and the *F*-test comparing the two coefficients is significant ( $F = 3.97$ ,  $p < 0.05$ ). We also find that related diversification is not associated with executive ownership.

Table 1. Descriptive statistics and correlations

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Total diversification (Herfindahl)	0.27	0.284														
2 Unrelated diversification (DU)	0.25	0.374	0.673**													
3 Related diversification (DR)	0.11	0.236	0.529***	0.191***												
4 Executive ownership (%)	1.73	4.625	-0.177***	-0.16***	-0.088**											
5 Firm size (\$ billion)	17.14	38.35	0.181***	0.105***	0.143***	-0.048										
6 Firm risk	0.03	0.042	-0.037	-0.052†	-0.067*	0.042	-0.096**									
7 Financial leverage	0.17	0.119	0.148***	0.179***	0.078*	-0.153***	-0.037	-0.017								
8 Stock options (\$ million)	19.94	72.526	0.071*	0.061*	0.045	-0.287***	-0.008	0.021	0.072*							
9 Change of CEO	0.08	0.263	0.055†	0.026	0.017	-0.078*	-0.009	-0.022	0.04	-0.05						
10 Prior performance	7.90	7.85	-0.138**	-0.149***	-0.02	0.188***	0.178***	-0.23***	-0.399***	-0.058†	-0.018					
11 CEO duality	0.79	0.407	0.098*	0.146***	0.002	-0.058†	0.031	-0.018	0.14***	0.033	-0.018	-0.004	-0.097**			
12 Board independence	0.74	0.215	0.09*	0.072*	0.067*	-0.128***	0.094**	-0.002	0.087†	0.088**	0.041	-0.037	-0.081**			
13 Director ownership (%)	3.57	6.997	-0.013	-0.015	-0.058†	0.102*	-0.084*	-0.016	-0.04	-0.007	-0.012	-0.027	-0.002	-0.133***		
14 Blockholders (%)	11.44	10.798	-0.126**	-0.072*	-0.074*	-0.064*	-0.406***	0.111***	0.021	0.064*	-0.024	-0.138***	0.033	0.018	0.02	
15 Total institutional ownership (%)	62.21	14.655	-0.073*	-0.06†	-0.032	-0.204***	-0.234***	0.036	0.012	0.15***	-0.025	0.085*	0.009	-0.176***	0.625***	

*n* = 961

Significant at: \*\*\*: 0.001 level; \*\*: 0.01 level; \*: 0.05 level; †: 0.1 level

Table 2. Diversification as a function of executive ownership (ordinary least squares with Newey-West correction)

Results	Total diversification (Herfindahl)			Unrelated diversification (DUI)			Related diversification (DR)					
	$t_1$	S.E.	$t_2$	S.E.	$t_1$	S.E.	$t_2$	S.E.	$t_1$	S.E.	$t_2$	S.E.
Intercept <sup>a</sup>	-0.096	(0.119)	-0.133	(0.119)	0.024	(0.172)	0.016	(0.167)	-0.177*	(0.088)	-0.193*	(0.088)
Firm size	0.040***	(0.011)	0.044***	(0.011)	0.044*	(0.021)	0.045*	(0.020)	0.023**	(0.008)	0.023**	(0.008)
Firm risk	-0.280	(0.273)	-0.274	(0.292)	-0.442	(0.359)	-0.469	(0.368)	-0.591***	(0.150)	-0.395*	(0.215)
Financial leverage	0.154†	(0.107)	0.209*	(0.103)	0.226*	(0.135)	0.213†	(0.134)	0.173*	(0.094)	0.235**	(0.095)
Stock options	0.001	(0.001)	0.001	(0.001)	0.002	(0.002)	0.002	(0.002)	0.001	(0.001)	0.001	(0.001)
Change of CEO	0.043†	(0.030)	0.056*	(0.031)	0.028	(0.039)	0.025	(0.038)	-0.014	(0.026)	0.004	(0.028)
Prior performance	-0.003*	(0.001)	-0.003*	(0.001)	-0.004*	(0.002)	-0.004*	(0.002)	-0.002*	(0.001)	-0.001	(0.001)
CEO duality	0.056*	(0.026)	0.046*	(0.026)	0.114***	(0.030)	0.111***	(0.028)	-0.033†	(0.023)	-0.031	(0.025)
Board independence	0.017	(0.042)	0.023	(0.045)	0.009	(0.053)	0.009	(0.053)	0.002	(0.032)	0.015	(0.032)
Outside director ownership	0.002	(0.002)	0.002†	(0.001)	0.002	(0.002)	0.001	(0.002)	0.000	(0.001)	0.000	(0.001)
Blockholders	-0.002†	(0.001)	-0.002†	(0.001)	-0.001	(0.002)	-0.001	(0.002)	-0.001	(0.001)	-0.001	(0.001)
Total institutional ownership	0.000	(0.001)	0.000	(0.001)	-0.002†	(0.001)	-0.002*	(0.001)	0.001†	(0.001)	0.001	(0.001)
Executive ownership	-0.005**	(0.002)	-0.004*	(0.002)	-0.008**	(0.003)	-0.007**	(0.003)	0.001	(0.002)	0.001	(0.002)
<i>F</i> -test for comparing coefficients on executive ownership across models for $t_1$ and $t_2$		0.21		0.48					0.54			
Adj. $R^2$ (%)		22.24		20.18		20.25		19.82		16.26		14.37

*n* = 961

Significant at: \*\*\* 0.001 level; \*\* 0.01 level; \* 0.05 level; † 0.1 level

<sup>a</sup> Dummy codes controlling for 2-digit SIC level are not reported here for brevity.

Table 3. Executive ownership in the firm as a function of three diversification measures (ordinary least squares with Newey-West correction)

Results	Executive ownership						Executive ownership						Executive ownership			
	$t_1$	S.E.	$t_2$	S.E.	$t_1$	S.E.	$t_2$	S.E.	$t_1$	S.E.	$t_2$	S.E.	$t_1$	S.E.	$t_2$	S.E.
Intercept <sup>a</sup>	9.821***	(2.436)	8.483***	(2.225)	9.954***	(2.433)	8.576***	(2.223)	10.10***	(2.478)	8.701***	(2.261)				
Firm size	-0.235	(0.205)	-0.212	(0.190)	-0.239	(0.202)	-0.213	(0.188)	-0.301†	(0.204)	-0.262†	(0.189)				
Firm risk	10.37*	(5.893)	10.76*	(5.669)	10.24*	(5.688)	10.65*	(5.510)	11.10*	(5.906)	11.36*	(5.682)				
Financial leverage	-1.733	(2.176)	-2.179	(1.946)	-1.687	(2.182)	-2.139	(1.954)	-2.037	(2.153)	-2.419	(1.925)				
Stock options	-0.112***	(0.033)	-0.103***	(0.030)	-0.111***	(0.033)	-0.102***	(0.030)	-0.115***	(0.033)	-0.105***	(0.030)				
Change of CEO	0.227	(0.594)	-1.205***	(0.319)	0.201	(0.593)	-1.223***	(0.320)	0.178	(0.598)	-1.239***	(0.322)				
Prior performance	0.102**	(0.037)	0.093**	(0.033)	0.102**	(0.036)	0.092**	(0.032)	0.108**	(0.037)	0.097**	(0.033)				
CEO duality	-0.071	(0.508)	-0.236	(0.462)	-0.019	(0.505)	-0.195	(0.461)	-0.129	(0.496)	-0.274	(0.453)				
Board independence	-1.654**	(0.675)	-1.498**	(0.636)	-1.663**	(0.675)	-1.503**	(0.636)	-1.688**	(0.688)	-1.522**	(0.646)				
Director ownership	0.006	(0.030)	0.008	(0.028)	0.006	(0.031)	0.008	(0.028)	0.004	(0.030)	0.006	(0.028)				
Blockholders	0.048*	(0.022)	0.042*	(0.019)	0.049**	(0.022)	0.042*	(0.019)	0.051*	(0.022)	0.044*	(0.020)				
Total inst'l ownership	-0.085***	(0.023)	-0.070***	(0.020)	-0.086***	(0.023)	-0.071***	(0.020)	-0.085***	(0.023)	-0.070***	(0.020)				
Total diversification (H)	-1.332**	(0.565)	-0.952*	(0.490)	-1.097**	(0.384)	-0.816**	(0.340)								
Unrelated diversification (DU)																
Related diversification (DR)																
<i>F</i> -test for comparing coefficients on diversification across models for $t_1$ and $t_2$	3.75*								3.97*							
Adj. $R^2$ (%)	22.54		22.45		22.71		22.59		22.08		22.20					

<sup>a</sup>  $n = 961$ 

Significant at: \*\*\* 0.001 level; \*\* 0.01 level; \* 0.05 level; † 0.1 level

<sup>a</sup> Dummy codes controlling for 2-digit SIC level are not reported here for brevity.

Hence, we find support for Hypothesis 2 for total and unrelated diversification.<sup>7</sup>

To test the robustness of our findings, we conducted several further analyses. First, we tested for possible curvilinear effects of ownership on diversification. Including a squared ownership term in the model does not affect our main findings and is not significantly related to subsequent changes in corporate diversification. Following Morck *et al.* (1988), we partitioned executive ownership into three groups (below 5%, 5–25%, and above 25%). Although none of the ownership groups is significantly related to subsequent changes in corporate diversification, two of them are statistically significant in the principal components model in the direction suggested by prior research, which indicates an incentive alignment effect for executive ownership below 5 percent and above 25 percent. However, the *F*-tests of the dynamics of the effects are not significant for the different ownership levels, consistent with our preceding findings.

Second, we reran all models using a 2-year time lag instead of a 1-year lag. We find similar statistically significant results, which suggest that our findings are not overly sensitive to the time-lag specification.

Third, we winsorized the top and bottom 1 percent of observations for our main dependent and explanatory variables and reran the models. Our conclusions remain unchanged, so our analysis is not driven by extreme observations. Thus, we conclude that our findings are robust to various specifications and contexts.

## DISCUSSION AND CONCLUSION

The main intent of this study was to reexamine the managerial ownership–diversification relationship by investigating how ownership affects diversification over time, as well as through exploring whether diversification may also precede ownership. Overall, our findings indicate that levels of ownership do not influence subsequent

changes in diversification according to a longitudinal approach. This finding is inconsistent with the cross-sectional predictions of the incentive alignment argument, in which managerial ownership is negatively related to corporate diversification. Our second finding also sheds an interesting light on the subject, namely, that corporate diversification levels are associated with subsequent changes in managerial ownership. Managers in firms with higher levels of corporate diversification react differently, in terms of their ownership changes, than do managers in firms with lower levels of corporate diversification. This finding challenges the prospect of increased ownership as solely an incentive alignment tool.

Previous research consistently shows that high levels of ownership are negatively related to levels of corporate diversification, in line with findings regarding ownership concentration and the presence of blockholders with respect to diversification (Bethel and Liebeskind, 1993). Based on these prior findings, we proposed that higher managerial ownership should be associated with reductions in corporate diversification. From a cross-sectional viewpoint, we find that ownership is negatively related to diversification, according to both our correlation table and our regression analyses. Also, consistent with theory, executive ownership is not associated with related diversification in a meaningful manner. Yet, from a longitudinal perspective, we find no significant relationship between current ownership and subsequent changes in diversification (see the bottom two rows of Table 2). This is a significant finding given Bergh's admonition that researchers must test both static and dynamic models of strategic phenomena. The results of our dynamic models indicate that the traditional incentive alignment arguments supported by the cross-sectional approaches in the diversification literature may need to be revisited.

From a practical perspective, there is a tendency to generalize the findings of cross-sectional data to long-term actions. Because diversification is largely considered an agency problem, there have been broad attempts to improve executive accountability through ownership requirements that require executives to have 'some skin in the game.' Requiring executives' wealth to be more tightly tied to the firm's increases executive risk bearing. For example, 38 percent of the largest companies require top management to hold equity with their employers, often at levels worth

<sup>7</sup> We also examined the relationship between total diversification as the sum of unrelated (DU) and related diversification (DR). We found that the beta (for total diversification) for time period one was  $-0.40$  ( $p < 0.10$ ) and the beta (for total diversification) for time period two was  $-0.58$  ( $p < 0.05$ ) based on the Bergh and Fairbank (2002) methodology. The difference between these coefficients is statistically different at ( $p < 0.10$ ).

two to eight times their base salaries (Winograd and Aisenbrey, 2001). However, our longitudinal results do not support the idea that providing executives with more ownership leads to less subsequent diversification and thereby raise serious doubts about ownership guidelines that require executives to own more of their firms, at least with respect to diversification.

Our results pertaining to Hypothesis 2 point to a different aspect of agency problems. Diversification is positively related to subsequent changes in managerial ownership, and we conducted an exploratory analysis of this relationship to determine whether these findings support the behavioral agency model perspective (e.g., Wiseman and Gomez-Mejia, 1998) or the signaling theory perspective (e.g., Ross, 1977; Spence, 1973). For the behavioral agency model, we split the sample at the median into high- and low-diversification firms and find that high-diversification firms have lower levels of income stream risk than do low-diversification firms (means of 0.026 and 0.032, respectively). These means are significantly different, with a *t*-test value of 2.234 ( $p < 0.05$ ). Thus, managers may indeed respond to the risk postures of their firms.

Our preliminary analysis indicates no support for the signaling perspective of optimism based on accounting and market measures for highly diversified firms (ROA for the high-diversification group is 7.04 for low changes in executive ownership subgroup and 7.18 for high changes in executive ownership subgroup); similarly, firm market returns for low changes in CEO ownership are 0.207, and firm market returns for high ownership changes are 0.161. In both cases, the *t*-tests indicate no differences in performance measures after changes in the ownership structures in the highly diversified subsample. These tests are, however, exploratory in nature. Although we rely on them for our discussion of the results related to Hypothesis 2, because we do not directly measure signaling intent and managerial risk, these exploratory analyses must undergo further validation.

Consistent with a behavioral agency approach (Wiseman and Gomez-Mejia, 1998), our results for Hypothesis 2 appear to indicate that executives will bear risk in response to the diversification strategies of their firms. We believe this finding is very interesting for several reasons. First, with the excessive emphasis on monitoring and incentive alignment as proactive solutions to agency

problems, researchers have seldom examined the other side of the story. If we take the traditional view of agency theory, with its risk-averse agent, we still come to the same conclusion, because at high levels of diversification unsystematic risk is likely to be lower (Amihud and Lev, 1981). Consequently, risk-averse managers will be more comfortable maintaining higher stakes because of the lowered employment risk in diversified firms.

Second, increases in managerial ownership have coincided with increases in other incentive alignment mechanisms, like stock options, in recent years. The increased usage of stock options may result in increasing levels of managerial ownership, but research indicates the contrary: managers tend to rebalance their portfolio immediately after exercising their in-the-money options (McGuire and Matta, 2003; Meulbroek, 2001; Ofek and Yermack, 2000). Thus, increases in managerial ownership cannot be attributed to the use of options compensation. This claim raises an interesting question: if there has been such a huge increase in the use of options compensation as an incentive alignment mechanism, why has it not been accompanied by a concurrent drop in the use of stock ownership? At some point, there must be diminishing returns from the overuse of different types of incentive alignment mechanisms. If, as our results suggest, managerial ownership is an *ex post* response to diversification, we must pay more attention to managerial ownership with a reactive rather than the proactive perspective of incentive alignment that dominates current research.

Although we have shed some light on the managerial ownership–diversification relationship, other research avenues could provide additional information. First, event studies could further illuminate when and how managerial ownership changes in reaction to diversification or provides signals to the market about diversification's value. Alternatively, event studies could investigate changes in diversification that are preceded by changes in ownership, and vice versa, to understand the process in greater detail. Second, research needs to disentangle the various effects that operate simultaneously in conjunction with ownership and diversification. Limited research has considered how incentive alignment, risk-bearing, employment risk, diversification, and valuation interact. Studies that can tease out the influence of multiple facets of incentive alignment, employment risk, and the like will be useful.

At this point, we also acknowledge some limitations of our current study. First, we focus on diversification based on the various business segments of a firm. However, Hitt, Hoskisson, and Kim, 1997 suggest that strategic alliances may act as a substitute for diversification moves by firms.<sup>8</sup> For example, firms may use strategic alliances to help reduce risk to the firm (Reuer and Leiblein, 2000). Alternatively, alliances represent a potential agency conflict, similar to diversification (Reuer and Ragozino, 2006). However, we have not examined the implications of alliances in this research, indicating a potential limitation. Future research can incorporate alliances to explore the links between managerial ownership, alliances, and diversification. Second, we use traditional ownership and diversification measures, albeit in a longitudinal manner, although recent work suggests that there may be limitations to these measures (Robins and Wiersema, 2003; Sambharya, 2000). Future research should examine these relationships using measures of diversification that examine relatedness in non-traditional ways. For example, our study is based on traditional industrial classifications and related measures of diversification, which have been demonstrated to involve a diversification discount. However, recent findings by Villalonga (2004a, 2004b) using business information tracking series (BITS) data challenge whether this diversification discount actually exists. It therefore would be interesting to replicate our findings with the BITS database.

Although one study cannot provide conclusive evidence about the full relationship between managerial ownership and corporate diversification, we have raised some questions regarding the conventional wisdom that states that managerial ownership results in incentive alignment and reduces corporate diversification. We also highlight the importance of reexamining traditional relationships using new perspectives and approaches.

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<sup>8</sup> We thank an anonymous referee for alerting us to this potential limitation.

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