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What Drives Firms to Diversity?

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WHAT DRIVES FIRMS TO DIVERSITY?

BY

RONG GUO

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree
of
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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor in Philosophy in Business Administration in the Robinson College of Business of Georgia State University.

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ABSTRACT

WHAT DRIVES FIRMS TO DIVERSITY?

By

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This paper examines whether corporate governance structures, serving as proxies for agency costs, can explain firms' decision to diversify. Specifically, it has been hypothesized that firms with worse corporate governance structures are more likely to diversify. The extant literature usually compares the governance characteristics of multi-segment firms to those of single segment firms to address this issue. However, different governance characteristics may simply reflect differences in firm characteristics of diversified firms and focused firms. Furthermore, industry factors may affect both the propensity of firms to diversify and their governance characteristics. To separate out the agency costs explanation of firms' decision to diversify, I compare the corporate governance structures of single segment firms that choose to diversify with those of a matched sample of single segment firms in the same industry that choose to remain focused. I find that firms with a higher percentage of outsiders on the board and smaller board size are more likely to diversify. These findings are inconsistent with the agency costs explanation of why firms choose to diversify. In addition, the CEO pay-to-performance sensitivity of diversifying firms is also not significantly different from that of firms that stay focused. The corporate governance characteristics cannot explain the changes in excess value around diversification either. Although some of the governance characteristics are significantly related to the announcement effects of diversifying mergers, these relations are often inconsistent with the agency cost explanation. Taken together, my evidence indicates that diversifying firms do not systematically have worse governance structures than firms that stay focused and, therefore, higher agency costs do not appear to drive the decision to diversify.

What Drives Firms to Diversify?

1. Introduction

The conventional wisdom in the literature is that corporate diversification, on average, leads to a substantial reduction in firm value.[1] An often cited reason for firms engaging in value destroying diversification activities is that they have higher agency costs, i.e., the managers of the firm attempt to capture private benefits such as lower employment risk and higher compensation even though diversification may destroy shareholders' value. Consequently, firms with effective governance systems in place should not diversify. In this paper, I focus on whether higher agency costs can explain the decision by firms to diversify.

A few studies in the literature attempt to relate agency costs to firms' decision to diversify (Denis, Denis and Sarin, 1997; Anderson et al., 2000). These studies usually compare one or several aspects of the corporate governance system (CEO compensation, ownership structure, and board composition) of multi-segment firms and single segment firms, and find mixed evidence on whether higher agency costs prompt firms to diversify. Since there are systematic differences in firm characteristics between diversified firms and focused firms, firms that choose to diversify may have different corporate governance structures than diversified firms. For example, diversified firms may have a lower pay-to-performance sensitivity because the equity-based pay has some deficiency for these firms (Paul, 1992). Conceivably these firms may have had higher pay-to-performance sensitivity before they diversified. Since firms make the decision to change their diversification level before they diversify rather than after they

[1] Consistent with this argument, Lang and Stulz (1994), Berger and Ofek (1995), and Servaes (1996) among others report that multi-segment firms trade at a discount relative to single segment firms. More recently, however, this evidence has been challenged. For example, Villalonga (2004) and Campa and Kedia (2002) document differences in characteristics between multi-segment firms and single segment firms, and find that the diversification discount disappears once self-selection is accounted for in the test design.

actually go through with these restructurings, the test design should compare the corporate governance structure of firms that choose to change their diversification levels with firms that do not at the time when they make the decision.

Furthermore, Campa and Kedia (2002) find that industry factors are more important than firm characteristics in determining the decision to diversify. Additionally, Gillan, Hartzell, and Starks (2003) document that industry factors such as industry investment opportunities and average leverage can affect governance characteristics. It is, therefore, critical to control for industry effects before I compare the governance structure of diversifying firms and firms that remain focused. By comparing the corporate governance structures of single segment firms that diversify in the next year with those of firms that remain focused in the same industry, I derive more reliable conclusions as to whether agency costs affect firms' decision to diversify.

Some of the salient results from my analysis are as follows. Using a much larger sample than previous studies to compare the firm and governance characteristics of single segment firms and multiple segment firms, I find that diversified firms have larger board size, lower CEO ownership, blockholder ownership and insider ownership, and weaker pay-to-performance sensitivity than single segment firms. These results are consistent with agency costs explanation for diversification.

As argued earlier, however, the more appropriate comparison of governance characteristics is between firms that choose to diversify with those that choose to remain focused. Furthermore, we are likely to arrive at incorrect conclusions if we also do not control for firm and industry characteristics too. With utilizing an industry-matched sample of similar single segment firms that choose not to diversify, my logistic regression analysis indicates that firms with more outsiders on board and smaller board size are more likely to diversify, which is

inconsistent with agency costs explanation of why firms choose to diversify. Additionally, I find that the CEO pay-to-performance sensitivity of diversifying firms is also not significantly different from that of firms that remain focused. These governance variables also cannot explain the changes in the excess value around diversification. Furthermore, the relation between governance characteristics and the announcement effects of diversifying mergers are mostly inconsistent with the agency costs explanation for diversification. Finally, I also compare firms that choose to refocus with firms that remain diversified and here too I do not find support for the agency costs hypothesis. Overall, I find little support for the hypothesis that agency costs can explain firms' decision to diversify.

The key contribution of my paper is that it clearly illustrates that it is inappropriate to compare the governance characteristics of multiple segment firms with those of single segment firms in order to investigate whether agency costs prompt firms to diversify. More specifically, it may be the case that the governance characteristics of focused and diversified firms may differ systematically, but that certainly does not mean that we are illuminated on the question of whether agency costs prompt firms to diversify from single segment to multiple segment firms. Therefore, simply comparing the governance characteristics of diversified firms and focused firms may give us unreliable inferences as to what drives firms to diversify. Finding scant support for agency costs explanation for the decision to diversify is consistent with the notion that the decision to diversify is not synonymous with value destruction. By benchmarking correctly, I find little evidence in support of agency costs explanation. My paper fits in with recent research that questions the existence of a diversification discount.[2]

[2] See, for example, Campa and Kedia (2002), Graham, Lemmon, and Wolf (2002), and Villalonga (2004).

The remainder of this paper is organized as follows. Section 2 gives an overview of related literature and derives some testable implications. Section 3 describes the sample selection procedure and methodology. Section 4 provides a comparison of multiple segment firms and single segment firms. Section 5 presents results based on the comparison of diversifying firms with all firms that stay focused. Section 6 describes results where diversifying firms are compared with a matched sample of firms that remain focused. Section 7 displays the results on refocusing firms and matched firms that stay diversified. Section 8 provides a summary of my results and some concluding remarks.

2. Prior Literature and Development of Hypotheses

2.1. Why Firms Change Focus

The extant literature refers to agency costs as an important explanation for firms' decision to diversify. It is argued that the diversified firms have higher agency costs and managers choose to diversify to benefit themselves at the expense of shareholders. Jensen (1986) argues that without significant ownership stakes, managers may pursue value-decreasing strategies to benefit themselves even though these strategies destroy shareholders' value. Conglomerate merger is deemed as a good example of these value-decreasing strategies. He argues that firms with large free cash flows and low growth opportunities have higher agency costs of free cash flows. It follows that, other things being equal, firms that have higher free cash flows and lower growth opportunities are more likely to diversify.

There are some empirical studies that have examined the association between the level of diversification and agency costs. Since the corporate governance system is the mechanism to control agency costs of the firm, many studies look at the relationship between diversification and different aspects of corporate governance systems. For example, Denis, Denis and Sarin

(1997) report that both insider ownership and outside blockholdings are higher in more focused firms and argue that lower agency costs are related to their lower level of diversification. Anderson et al. (2000) look at corporate governance variables and their relationships with the level of diversification. They find that CEOs of diversified firms tend to have lower equity holdings, higher levels of pay and lower sensitivity of pay to firm performance, which seems to be consistent with the agency costs explanation for diversification. However, they find that diversified firms tend to have more outside directors than firms that stay focused, which is inconsistent with the agency costs explanation. They also find that CEO turnover is no less sensitive to firm performance in diversified firms, which is not consistent with the view that managers in diversified firms are more entrenched than their counterparts in focused firms. They conclude that there is no compelling evidence that internal governance failures are associated with the decision to diversify.

Another reason that firms choose to diversify is that diversification is the optimal strategy for them to support their future growth. If a firm grows above a level, it may divide its existing single segment into multiple segments for operational or managerial convenience. Or, the firm may think that acquiring a related or seemingly unrelated firm may be very helpful for its future growth because it solves problems related to its factor or product market, strengthens its research and development, expands its sales channel, or simply because it can form an internal capital market that can supply inexpensive capital more efficiently.

2.2. Why New Benchmark

As there are significant differences in the characteristics of diversified firms and focused firms, simply comparing the corporate governance structure of diversified firms and single segment firms can be misleading. Diversified firms and focused firms have different governance

structures due to reasons other than agency costs. For example, the observation that managers of diversified firms have higher levels of compensation may be due to their higher managerial expertise and ability. For example, Rose and Shepard (1997) suggest that managing a diversified firm is a more difficult task and requires broader capability and knowledge. Consistent with this argument, Berry, Bizjak, Lemmon, and Naveen (2002) find that CEOs of diversified firms are older, have a longer time working in the firm before assigned as CEO, and have higher education level (e.g., college degree, graduate degree, or the degree from a top-tier school) than the CEOs of focused firms. Coles, Daniel, and Naveen (2002) document evidence that diversified firms may have a greater need for outside board members for consulting purposes. Paul (1992) demonstrates that firms, such as diversified firms, that require CEOs to allocate the efforts across a broad set of activities, the equity-based compensation generally will not provide the proper incentives. These firms should use other corporate governance mechanisms to offset the deficiencies of the equity-based compensation. Schaefer (1998) documents evidence that pay-to-performance sensitivity is inversely related to firm size.[3] As a result, diversified firms will have lower pay-to-performance sensitivity as the CEOs of diversified firms need to allocate the effort across different segments and these firms tend to be larger than single segment firms.

As the previous literature compares the corporate governance characteristics of multi-segment firms and single segment firms, what they find may just reflect the systematic differences in characteristics of diversified firms and single segment firms. So, rather than simply use diversified firms' governance structures as proxies for governance structures of those firms that choose to diversify, I compare the diversifying firms from single segment to multiple segments with those single segment firms that stay focused. Since they are all single-segment

[3] Jensen and Murphy (1990) also find that CEOs of large firms tend to own fewer stocks and have lower pay-to-performance sensitivity than CEOs of small firms.

firms, the differences in corporate governance structure should not be related to the systematic differences in firm characteristics for diversified firms and focused firms.

Furthermore, it is also important to separate the influence of a firm's industry on both its decision to diversify and its governance characteristics. Campa and Kedia (2002) find that while firm level characteristics are not very significant in explaining the diversification decision, the industry instruments can significantly explain the probability of diversification. In addition, Gillan, Hartzell, and Starks (2003) document that the governance structure is related to the industry factors such as investment opportunities, product uniqueness, competitive environment, leverage, and industry's return volatility. Thus, industry factors affect both firms' decision to diversify and their governance characteristics. To deal with this endogeneity problem, I match each diversifying firm with a firm that stays focused by SIC codes and firm size. Using an appropriate benchmark gives us a more accurate picture of whether higher agency costs motivate firms to diversify.[4]

2.3. Corporate Governance Characteristics and Firms' Decision to Diversify

2.3.1. CEO Compensation

It has been argued that firms that pay their CEOs higher compensation tend to have higher agency costs. For example, according to Berle and Means (1932), CEOs can use their control over their boards to extract "excessive" levels of compensation. Core et al. (1999) find that firms with weaker governance structures tend to pay their CEOs more. In particular, they find that CEO pay goes up with the number of outsiders appointed by the CEO, the number of

[4] Anderson et al. (2000) also look at the governance structure differences between those firms that stay focused (59 firms in their sample) and those firms that diversify from singe segment firms to multiple segment firms (10 firms in their sample). They report a lower fractional ownership of CEO, a lower fractional ownership of blockholders, and a lower fraction of outside directors for those firms that diversified. However, neither these differences in governance structures nor differences in revenue-based excess value are significant. This may be due to their small sample size. My larger sample size increases the power of my tests relative to theirs and, therefore, increases the chance of finding significant differences in governance characteristics.

directors over age 69, board size, and the number of busy directors (proxied by the number of additional directorships held by a director).

Performance-based compensation can provide the incentives for CEOs to take particular actions to increase the value of the firm (Jensen and Murphy, 1990). The pay-performance sensitivity represents the CEO's share of the value created. The higher the sharing rate, the lower the agency costs should be. It follows that firms that have higher CEO pay-to-performance sensitivity should have lower agency costs. Therefore, if agency cost is the main reason that drives a firm to diversify, I expect a higher CEO compensation and a lower pay-to-performance sensitivity for firms that choose to diversify.

2.3.2. Board Structure

More outside board members should decrease agency costs and increase firm value. Fama (1980) argues that outsiders on the board of directors act as referees between shareholders and managers. Empirical evidence shows that more outsiders on the board seem to imply better governance. For example, Brickley and James (1987) document evidence that more outsiders on the board can decrease managerial consumption of perquisites in the banking industry. Weisbach (1988) finds the sensitivity of CEO turnovers to performance is greater when there is a majority of outsiders. Gillette, Noe, and Rebello (2003) use experiments to examine if the board can be designed to mitigate the interest conflict between insiders and owners. They find that a majority of outsiders on board can implement institutionally preferred policies even though these board members are uninformed. All these studies find evidence that more outsiders on boards can

effectively reduce agency costs. It follows that if agency costs drive firms to diversify, then we should expect that firms with more outsiders on board are less likely to diversify.[5]

Byrd and Hickman (1992) find that firms with a majority of outsiders on board make better acquisitions. Thus, firms with higher levels of monitoring that comes with a higher proportion of outsiders on the board will make more efficient diversifying decisions. I expect to find a positive relation between the changes in excess value around diversification events and the proportion of outsiders on the board.

It has been argued that when boards get bigger, the boards become more symbolic and less a part of the management process, thus the agency problems are more severe. Yermack (1996) examines the relationship between the board size and Tobin's q after controlling for other variables that are likely to affect Tobin's q. He documents a significant negative relationship between board size and Tobin's q. He also finds firms with smaller boards have a stronger relation between firm performance and CEO turnover than firms with larger boards. I, therefore, expect firms with larger board size are more likely to diversify after controlling for firm size.

When the CEO also holds the position of the Chairman of board (duality), the board cannot effectively perform its key functions, including evaluating and firing CEOs. However, there are also costs of separating the CEO and Chairman positions such as the costs in monitoring the Chairman, costs of information sharing between CEO and the Chairman, and incentive costs related to the succession process in which the CEO is promised the Chairman title. Brickley et al. (1987) compare the performance of firms that separate the duties of the CEO and Chairman with those that combine them. They find that firms that combine the duties perform as

[5] I define directors as insiders if they are officers of the firm and outsiders as non-officer directors. This officer-director definition can also be found in other studies (see, for example, Agrawal and Knoeber, 2001). I obtain data on board composition from *Compact Disclosure*.

well as those that separate them. They also find that for the firms that separate the titles, most of their good performing CEOs are eventually granted both titles. Therefore, the evidence suggests that some firms use the title of Chairman as an incentive for new CEOs, and the difference in duality largely reflects the cross-sectional differences in the timing of CEO successions.

Although separating the CEO and the Chairman of board does not affect future firm performance significantly, it does affect the sensitivity of CEO turnover to past firm performance. Goyal and Park (2002) find that the sensitivity of CEO turnover to firm performance is significantly lower when CEO is also the Chairman of the board. This implies that the board is less effective in removing poorly performing CEO when this CEO is also Chairman of the board. It follows that if the benefits of effective monitoring outweigh the costs, separating the position of CEO from the Chairman of board will be related to better governance and a lower probability that the firm will choose to diversify.

2.3.4. Ownership Structure and Firm Value

Firms with managers who have higher ownership stakes will be less likely to undertake activities that are in conflict with shareholder value maximization. It follows that if agency costs drive firms to diversify, higher CEO, insider, and director ownership stakes are all related to lower probability of firms' decision to diversify. A higher institutional ownership and blockholder ownership are also related to lower probability of diversification, because with a higher ownership stake in the firm, institutions and blockholders have greater financial incentives to watch the CEO's decision more attentively than otherwise.

Given the above discussion, I hypothesize that by comparing the corporate governance structure of single-segment firms that choose to diversify and those that choose not to diversify, the diversifying firms will have higher CEO compensation, lower sensitivity of pay-to-

performance, larger board size, smaller proportion of outsider board members and higher proportion of CEO also serve as the Chairman of the board, lower CEO, insider, and director ownership stakes, lower institutional ownership, lower blockholder ownership if agency costs motivate diversification activities.[6]

3. Data and Sample Selection

*3.1. **Sample Selection Procedure***

The sample consists of all firms with data reported on the Compustat Industry Segment database from 1992 to 2003 (excluding the year of 1997)[7]. I follow the Berger and Ofek (1995) sample selection criteria and exclude observations where firms report segments in the financial sector (SIC 6000-6999), or sales less than $20 million, or the sum of segment sales deviated from total sales by more than one percent, or the market values of the firms are missing. Then I merge the data from Compustat Industry Segment database with Compustat ExecuComp database and Compact Disclosure database.

The final sample consists of a total of 4,025 firm-year observations for multiple segment firms and 5,571 firm-year observations for single segment firms. I find that 229 of these firms choose to diversify. To construct my industry and size-matched sample, I match each diversifying firm with a firm that stays focused and has the same four-digit SIC code as the diversifying firm and with assets closest to that of the diversifying firm. I also require that this matching firm has to have assets within 10% of the assets of the diversifying firm.[8] If I cannot

[6] All these hypotheses are built on the assumption that diversification leads to value destruction.

[7] While I have collected data for 1997, I only report results for the sample period 1992-2003 (excluding 1997) since in 1998 changes in reporting requirement resulted in a large number of previously single segment firms reporting multiple segments. My results for the sample period 1992-2003 (including 1997) are, however, consistent with those reported in this paper.

[8] I conduct robustness tests by allowing the matched firm to have assets within 25% of the assets of the diversifying firm. By using this matching criteria, out of my 229 diversifying firms, 44 firms are matched at the four-digit SIC

identify any firm that stays focused within the same four-digit SIC code, then I match first at the three-digit, then at the two-digit, and if needed at one-digit SIC code level. If no one-digit SIC code match firm is found, I select the firm closest in assets to the diversifying firm. Out of my 229 diversifying firms, 26 firms are matched by 4-digit SIC code, 15 are matched by 3-digit SIC code, 58 are matched by 2-digit SIC code, 98 are matched by 1-digit SIC code, and 32 are matched by assets only. At the end of my matching process, I have 229 diversifying firms and 229 matching firms that choose not to diversify.

3.2. Corporate Governance Variables

I collect data on the size and composition of the board of directors, CEO duality, CEO ownership, director ownership, insider ownership, institutional ownership, and blockholder ownership from Compact Disclosure.

The other corporate governance variables (like CEO compensation) are collected from the Compustat ExecuComp dataset. This study incorporates four CEO compensation measures. The first measure is the fixed portion of total compensation which is the sum of salary and bonus. The second compensation measure is the annual value of the total option portfolio. The third measure is the total compensation, which is the sum of the salary, bonus, and option value. The fourth measure is the equity-based pay, which is the ratio of the value of the CEO's option portfolio to the total compensation.

The sensitivity of CEO pay-to-performance is an important factor in corporate governance. Following the methodology of Jensen and Murphy (1990), I estimate the regression of the first difference of dollar compensation on the change in market value of equity, a multi-segment (or diversifying) indicator equal to one for multi-segment (or diversifying) firms, and an

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code level, 28 are matched at the three-digit SIC code level, 80 are matched at the two-digit SIC code level, 68 are matched at the one-digit SIC code level, and 9 are matched by assets only. My results using this matching approach are similar to those reported in the paper.

interactive term of the change in market value of equity and the multi-segment (or diversifying) indicator. The coefficient of the change in market value of equity captures the pay-to-performance sensitivity of single-segment firms (or firms that stay focused), while the coefficient of the interaction between the change in market value of equity and the multi-segment (or diversifying) indicator represents the difference in the pay-to-performance sensitivity for multi-segment firms (or diversifying firms) and single segment firms (or firms that stay focused).

3.3. Methodology

The primary objective of this paper is to show that it is inappropriate to compare the governance characteristics of multiple segment firms with those of single segment firms in order to investigate whether agency costs prompt firms to diversify. To demonstrate this point, I perform the same battery of tests using two samples. The first sample of firms includes all multi-segment firms and single segment firms and the second sample includes firms that diversify from single segment firms to multi-segment firms next year and single segment firms that stay focused next year. This set of tests includes univariate comparisons of firm characteristics and governance characteristics of all single segment firms (single segment firms that remain focused next year) and multiple segment firms (single segment firms that diversify in the next year), comparison of the pay-to-performance sensitivity of all single segment firms (single segment firms that remain focused next year) and multiple segment firms (single segment firms that diversify in the next year), and estimation of logistic regressions to examine whether corporate governance characteristics affect firms' decision to diversify.

Since it is critical to control for firm size and industry effects, I first construct a size and industry matched sample of firms that stay focused next year prior to making the comparison between the governance structure of diversifying firms and firms that remain focused. In addition

to the above tests, I also use both OLS regression and Heckman's model to investigate whether firms with stronger governance structure show an improvement in the excess value around diversification events. Finally, I estimate the cumulative abnormal returns around diversifying mergers. I then estimate both OLS and Heckman's regression models to examine whether firms with better governance characteristics experience a more positive market reaction to announcements of diversifying mergers.

4. Results on Multiple Segment and Single Segment Firms

4.1. Univariate Comparisons of Firm Characteristics and Governance Characteristics

Table 1 displays descriptive statistics on the excess value, number of segments, assets, sales, operating income-to-sales ratio (*EBIT/SALES*), net profit margin (*NPM*), capital expenditure-to-sales ratio (*CAPX/SALES*), capital expenditure-to-total assets ratio (*CAPX/TA*), total liabilities-to-assets ratio (*LEVER*), long-term debt-to-assets ratio (*LTDLEVER*), R&D-to-sales ratio (*R&D/SALES),* free cash flow *(FCF),* and Tobin's q ratio *(TOBINQ)* for multiple segment firms and single segment firms.[9, 10] There are 4,025 observations for multiple segment firms and 5,571 observations for single segment firms. Consistent with previous studies (see, for example, Anderson et al., 2000), I find that the diversified firms have lower excess value, larger size, higher leverage ratios, lower capital expenditure intensity, and a lower R&D intensity than the single-segment firms. The mean (median) excess value is 0.006 (-0.003) for diversified firms compared with 0.175 (0.132) of single segment firms. On average, the diversified firms have

[9] Following Lehn and Poulsen (1989), I measure free cash flow as operating income before depreciation (Compustat item #13) minus total income taxes (Compustat item #16), change in deferred taxes from the previous year to the current year (change in Compustat item #35), interest expense (Compustat item #15), preferred dividends (Compustat item #19), and dividends on common stock (Compustat item #21); then I divide the total assets by this free cash flow to normalize this measure.

[10] I use the market-to-book ratio to compute the Tobin's q, i.e., Compustat item (#6-#60+(#199*25)/#6, where #6 is the book value of assets, #60 is the book value of equity, #199 is the stock price at the fiscal year end, and #25 is the common shares outstanding.

three segments and focused firms have one segment. Both the median assets and sales of diversified firms are about twice the size of single segment firms. The mean (median) capital expenditure to sales ratio is 0.074 (0.046) for diversified firms, compared with 0.105 (0.053) for single segment firms. The mean (median) debt ratio is 0.462 (0.461) for diversified firms compared with 0.411 (0.403) for single segment firms. On average, the R&D-to-sales ratio of diversified firms is 1/3 to 1/2 that of single segment firms. The diversified firms also have significantly lower Tobin's q than single segment firms with the mean (median) Tobin's q for diversified firms equal to 1.367 (1.104), compared with 1.924 (1.439) for single segment firms. However, this does not imply that diversified firms have higher agency costs of free cash flow, because the diversified firms also have lower free cash flows than focused firms.

Table 2 presents the summary statistics of the corporate governance characteristics for the single segment firms and multiple segment firms. The salary and bonus of CEOs of diversified firms are significantly higher than those of CEOs of focused firms. The median salary and bonus for CEOs of diversified firms is $277,000 higher than that for CEOs of focused firms. The multiple segment firms have significantly lower CEO ownership, director ownership, insider ownership and blockholder ownership. For example, the CEOs of diversified firms have a mean (median) equity ownership of 4.91% (1.36%), compared with 5.92% (2.09 %) for CEOs of focused firms. Diversified firms also tend to have significantly larger boards, higher percentage of outsiders on board, more CEOs holding the position of Chair of the Board, and greater institutional ownership.

4.2. Comparison of the Pay-to-Performance Sensitivity

Table 3 provides results comparing the sensitivity of CEO pay-to-performance for multiple segment and single segment firms[11]. I find that the coefficient of the interaction term of the multi-segment indicator and the market value of equity for all model specifications are negatively significant. This means that the salary and bonus, the value of option owned, and the total compensation of CEOs of multi-segment firms are less sensitive to performance than their counterparts in single segment firms. The magnitude of parameter estimates in column three implies that for each $1,000 change in shareholders' wealth, the total compensation for CEOs of single-segment firms increases by $2.993, while the total compensation for CEOs of diversified firms increases by $0.983, with the difference of $2.010 being both statistically and economically significant.

4.3. Logistic Regression on What Drives the Decision to be a Multi-Segment Firm

Table 4 presents logistic regression results which model the likelihood that a firm is diversified as a function of governance variables. In these regressions, the dependent variable is a dummy variable that takes the value of one if the firm has multiple segments; else it takes the value of zero. In all the reported models, I control for firm characteristics. Specifically, all model specifications contain the natural logarithm of firm size, operating profit margin, capital

[11] I follow Core and Guay's (2002) approximation method to compute the fiscal year-end value of the CEO's option portfolio. Core and Guay (2002) also propose a method to compute the sensitivity of option value to the change in stock volatility (Vega), but their methodology can only be used to find the Vega of each CEO. The issue of interest in this paper is whether the Vega is different for diversifying firms and firms that stay focused. I follow Jensen and Murphy (1990) and Anderson et al. (2000) to compute the pay-to-performance sensitivity. They do not compute the pay-to-volatility sensitivity. However, similar to their method for finding pay-to-performance sensitivity, I calculate the pay-to-volatility sensitivity by estimating a regression of the change in CEO compensation on the change in the underlying stock volatility of the firm and the interactive term of the multi-segment dummy (diversifying dummy) and the volatility of the underlying stock. The coefficient of the change in stock volatility is the Vega and the coefficient of the interactive term captures the difference in Vega for multi-segment firms and single segment firms (diversifying firms and firms that stay focused). In all the model specifications comparing the Vega of multi-segment firms and single segment firms as well as those comparing the Vega of diversifying firms and firms that stay focused, the coefficient associated with Vega is negative for CEO salary and bonus, but positive for the value of option portfolio and total compensation. There is no significant difference in Vega for multi-segment firms and single segment firms. Neither do any differences exist in Vega for diversifying firms and firms that stay focused.

expenditure intensity, leverage, and Tobin's q as control variables. In all these specifications, firms that have a larger firm size, lower capital expenditure intensity, and lower Tobin's q are more likely to be multi-segment firms.

In the first model, I only include the compensation variables. I do not find any significant relationship between CEO compensation and firms' propensity to have multiple segments. In the second model, I only include board-related variables. In this model, I find that firms that have more outside directors on board, larger board size, and CEO duality are more likely to be multi-segment firms. In the third model, I only include ownership variables. Here I find that firms that have lower CEO ownership, lower blockholder ownership, and higher institutional ownership are more likely to be multi-segment firms. In the last model, I include all these governance structure variables. In this model, I find that firms that have more outsiders on board, larger board size, duality, lower CEO ownership, and higher institutional ownership are more likely to be multi-segment firms.[12] While the results related to board size and CEO ownership appear to be consistent with agency costs explanation, the results related to board composition and institutional ownership are inconsistent with this hypothesis. Nevertheless, as argued before, all that these regressions tell us is whether governance variables are related to the likelihood of firms to be diversified or not, and does not really address the issue of whether they have a bearing on the decision to diversify.

5. Results on Diversifying Firms and All Firms that Stay Focused

[12] I also include the G-index in the logistic regressions in addition to the other governance variables in Table 4. The corporate governance index (G-index) is constructed by Gompers, Ishii and Metrick (2003). It measures the number of takeover provisions adopted in corporate bylaws and it proxies for the level of shareholder rights. The index is constructed based on information from the Investor Responsibility Research Center (IRRC) on 24 governance rules for approximately 1,500 firms. For every firm, one point is added for every provision that reduces shareholder rights. Therefore, a higher G-index implies weaker governance and a lower G-index is an indication of stronger governance. I find that the G-index is positively significant in all model specifications, implying that firms with poor protection of shareholder rights are more likely to be multi-segment firms. I do not include these results in the paper since the inclusion of the G-index appreciably reduces my sample size.

5.1. Univariate Comparisons of Firm Characteristics and Governance Characteristics

Tables 5 and 6 display descriptive statistics on firm and governance characteristics for firms that choose to diversify and all the single segment firms that choose to remain focused. There are 229 observations for firms that diversify from single segment firms to multiple segment firms, whereas there are 4,948 observations for firms that choose to remain focused. I find that the diversifying firms have larger size, lower capital expenditure intensity, fewer growth opportunities, and spend less on R&D than the firms that stay focused. Both the assets and sales of the firms that choose to diversify are about 1.5 times the size of the firms that choose to stay focused. The significant differences in capital expenditure intensity, Tobin's q and R&D ratio may reflect the differences in industry that diversifying firms and firms that stay focused are in, therefore, I need to control for industry effects on the decision to diversify and corporate governance before I can make reliable inferences. Firms that choose to diversify also have higher leverage ratios and lower free cash flows. The mean (median) debt ratio is 0.444 (0.452) for diversifying firms, which is much bigger than the 0.409 (0.397) for firms that stay focused. Firms with lower free cash flow and higher leverage may choose to diversify to utilize the internal capital markets of diversified firms.

Table 6 presents summary statistics on corporate governance characteristics for single segment firms that choose to diversify in the next year and all the single segment firms that choose not to diversify in the next year. In Table 6, the blockholder ownership of firms that choose to diversify is significantly higher than that of firms that choose to remain focused. Both the t-statistic and z-statistic are significant at the 10 percent level. The firms that choose to diversify also have higher total direct pay (i.e., salary and bonus), larger board size, and lower insider ownership. However, only the z-statistics that compare the median of these variables are

significant, the t-statistics that compare the mean of the variables are not significant. The other governance characteristics are about the same for firms that choose to diversify and those that choose to remain focused. These observations are generally consistent with the agency costs explanation for why firms diversify. However, they are also consistent with the fact that diversifying firms usually are bigger, and bigger firms tend to have higher pay, larger board, and lower insider percentage ownership.

5.2. Comparison of Pay-to-Performance Sensitivity

The results comparing the sensitivity of CEO pay-to-performance between firms that choose to diversify and firms that choose to stay focused are presented in Table 7. In Table 7, the coefficient of the interactive term of the diversifying indicator and the market value of equity for the first model specification is significantly positive, and for the other two models is negative but insignificant. This means that while the salary and bonus of CEOs of diversifying firms are more sensitive to performance than those of firms that stay focused, the value of options owned by CEO and total compensation have similar sensitivity to firm performance.

5.3. Logistic Regression on What Drives Firm to Diversify

I address the issue of whether agency costs are related to firm's decision to diversify in Tables 8 and 12. In Table 8, the firm-year observations include single segment firms that diversify in the next year and all single segment firms that continue to remain focused in the following year. In the last model, where I include all the governance variables, I find that both the proportion of insiders on the board and blockholder ownership are positively and significantly related to the probability that a firm will diversify. All other governance variables are not significant. Regardless, these results could simply reflect the fact that the firm characteristics of firms that diversify are quite different from those that remain focused. In

addition, the industry composition of these two types of firms could be quite different and I could conceivably be picking up differences in governance characteristics across industries. Finally, the vastly different sample sizes for the two groups of firms could also make my inferences unreliable.

6. Results on Diversifying Firms and Matched Firms that Remain Focused

6.1. Univariate Comparisons of Firm Characteristics and Governance Characteristics

Table 9 compares diversifying firms with a size-matched sample of firms that stay focused and operate in the same industry as the diversifying firms. Thus, this matched-sample approach yields 229 diversifying firms and 229 firms that stay focused. I find that in comparison to their peers in the same industry, diversifying firms have lower R&D expenditure and Tobin's q ratio than firms that stay focused. The mean (median) Tobin's q is 1.635 (1.256) for diversifying firms, while it is 1.921 (1.442) for firms that stay focused. However, only the t-statistics of both variables are significant. There are no significant differences in the excess value, firm size, the profitability ratios, capital expenditures and leverage ratios for diversifying firms and firms that stay focused. This means that the differences in most of the above variables in Table 5 can be related to the differences in firm size and the industry factors of firms that are more likely to diversify and firms that are more likely to remain focused.

Table 10 compares the governance characteristics for these two samples of firms. I find that only the median total direct pay and the mean option value granted in the current year are significantly different for diversifying firms and firms that stay focused. The mean option granted in the current year of the diversifying firms is about one half of firms that stay focused. The median option granted in the current year of the diversifying firms is about the same of firms

that stay focused and is not significant. It seems that diversifying firms tend to pay their CEOs in the form of direct pay rather than new option granted.

6.2. Comparison of the Pay-to-Performance Sensitivity

The results comparing the sensitivity of pay-to-performance between firms that choose to diversify and firms that choose to stay focused are presented in Table 11. In this table, the coefficients of the interactive term of the diversifying indicator and the market value of equity for all model specifications are insignificant. This means that the CEO pay-to-performance sensitivity in diversifying firms is not significantly lower than that in firms that stay focused.[13]

6.3. Logistic Regression on What Drives Firm to Diversify

As mentioned before, firm size and industry factors can affect both the firm's governance characteristics and the firm's propensity to diversify. To get around these issues, the sample in the logistic regressions reported in Table 12 includes the same set of single segment firms that diversify in the next year as in Table 8, but the sample of single segment firms that remain focused the following year is matched by firm size and industry. In the first three columns of this table, none of the governance variables are significant. In the last column of the table where all the governance variables are included, I find that both the percentage of insiders on board and

[13] There are 1,753 firms that diversify from single segment firms to multi-segment firms. 155 of them have governance data available both before and after they diversify. On average, the number of segments increases from one segment to three segments after firms diversify. The mean (median) of *CAPX/TA* decreases from 0.067 (0.055) to 0.057 (0.047) around diversification. The mean (median) of *BINS* decreases from 0.329 (0.273) to 0.282 (0.250) around diversification. Other firm characteristics and governance characteristics do not change significantly around diversification. The pay-to-performance sensitivity increases significantly after diversification for the option portfolio that the CEO owns and the total CEO compensation; however, the pay-to-volatility sensitivity does not change significantly around diversification. I also examine the changes in corporate governance prior to the diversification decision. I do not find any significant changes in governance characteristics from two years before the firm makes the diversification decision (t-2) to one year before the firm makes the diversification decision (t-1) and from two years before the firm makes the diversification decision (t-2) to the year that the firm makes the diversification decision (t).

the board size are negatively related to the probability that a firm chooses to diversify. These results are inconsistent with the agency costs explanation of why firms choose to diversify.[14]

6.4. Change in Excess Value around Diversification and Corporate Governance Characteristics

I examine the change in excess value around diversification and whether it is related to corporate governance characteristics in Table 13. Some firms have weaker governance structure and higher agency costs, and they may choose to diversify to benefit the CEO instead of the shareholders. Other firms have stronger governance structure and lower agency costs, and they may choose to diversify to increase the firm value (from good motivations). Therefore, I hypothesize that good corporate governance is positively related to the change in excess value around diversification. As shown in column one of table 13, none of the governance characteristics can explain the change in excess value around diversification.[15]

6.5. Abnormal Returns around Diversification and Corporate Governance Characteristics

Next, I assume that the market is efficient and can distinguish between good diversification from bad diversification decisions. If firms choose to diversify for good reasons, the market will respond positively, and abnormal returns around the diversification event window will be positive for good diversification decisions and negative for bad diversification decisions.

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[14] I also include the G-index in addition to the other independent variables in the logistic regressions estimated in Table 8 and Table 12. In both tables, the G-index is always insignificant, meaning that weaker shareholder rights (or higher agency costs) cannot explain why firms choose to diversify.

[15] To check the robustness of my results, I construct a dummy variable that equals one if the excess value increases after diversification, and equals zero otherwise. Then I estimate a logistic regression with the governance variables as explanatory variables. Both equity-based pay and duality are negatively related to the probability that excess value increases after diversification, implying that firms that give their CEOs higher equity-based pay and have CEO duality are less likely to improve their excess value after diversification.

To test this conjecture, I merge my sample of firms (1,753 firm-year observations) that diversify from single segment firms to multi-segment firms in the next year with the Compact Disclosure dataset and Compustat ExecuComp dataset, and get a smaller sample (229 firm-year observations) of diversifying firms that have all the governance data available. Then I merge this sample with the Worldwide M&A Section of the Securities Data Company (SDC) database to get the announcement date and effective date of all diversifying mergers and acquisitions. My final sample contains 204 firm-year observations. I compute the abnormal returns for the three fixed windows (-10, +1), (-1, +1) and (-5, +5) and one moving window (announcement data -5, effective date +5). The market model parameters are estimated using daily returns from -255 to -51 relative to the merger announcement for this bidder and using the CRSP equally-weighted market return. I follow Kale, Kini, and Ryan (2003) to calculate the control variables. For example, *OFFERSTOCK* is a dummy variable that equals one if the offer is not cash only. In column one, the dependent variable is the cumulative abnormal returns (CARs) for the window (-10, +1). Only *CAPX/SALES* is negatively significant, implying that firms with higher capital expenditure intensity experience lower abnormal returns around the announcement of diversification event. The second column reports CARs for the window (0, +1). Only *EBP* is negatively and significantly related with the CARs at the 10 percent level. It seems that the market reacts more positively to the announcement of diversification event of firms that give their CEOs lower equity-based pay. The third column presents the results for the window (-5, +5). In addition to the total CEO compensation and equity-based pay, board size is also significant at the 10 percent level. The larger the board size, the lower the CARs. Finally, the results on the moving window (announcement date -5, effective date +5) are displayed in the fourth column. Here, only the board size is negatively and significantly related to the CARs.[16]

[16] As a robustness check, I construct a dummy variable that equals one if the CAR is positive and zero otherwise.

Overall, the results for board size seem to be consistent with the agency costs explanation; however, the results on the total CEO compensation and equity-based pay are inconsistent with the agency cost theory.[17]

7. Results on Refocusing Firms and Matched Firms that Remain Diversified

I also compare the refocusing firms with a matched sample of firms that stay diversified. The matching criteria are similar to the one I use to identify the matched sample for diversifying firms (see page 13). As refocusing firms usually have fewer segments than firms that stay diversified, I also require the number of segments to be the same when finding the matching firm. I find that, compared to the matched sample of firms that stay diversified, refocusing firms have lower profitability (*NPM*), higher capital expenditure intensity (*CAPX/TA*), and lower R&D to sales ratio. The mean (median) *NPM* of refocusing firms is -0.018 (0.036), while the mean (median) *NPM* for the matched sample is 0.042 (0.048). The mean (median) *CAPX/TA* ratio of refocusing firms is 0.072 (0.051), in contrast, the mean (median) of the matched sample is 0.053 (0.049). The mean R&D to sales ratio for refocusing firms is 0.044, while it is 0.027 for firms that stay diversified. It seems that firms that perform poorly and invest more in capital expenditure are more likely to adopt a refocusing strategy.

With respect to corporate governance characteristics, the blockholder ownership of the refocusing firms is higher than that of firms that stay diversified; the mean (median) blockholder ownership of refocusing firms is 33.00% (28.39%), while the mean (median) of firms that stay

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Both board size (in the last two columns) and institutional ownership (last column) are negatively and significantly related to the probability that a firm has a positive market reaction after the announcement of the diversifying mergers and acquisitions event.

[17] I also compute the Delta and Vega for each CEO using Core and Guay's (2002) methodology and include them in the logistic regressions tests and the tests on the change in excess value around diversification events and announcement effects of diversifying mergers. The inclusion of these two variables does not change the main results of this paper. I also use Heckman's two stage model to control for the possible selection bias in Table 13 and Table 14. I choose not to report the results in the table because the inverse mills ratios in all the model specifications are insignificant and the results are basically the same as the OLS regressions.

diversified is 25.74% (22.69%). For the total direct compensation, there is no significant difference in the pay-to-performance sensitivity and the pay-to-volatility sensitivity for refocusing firms and firms that stay diversified. For the option portfolio the CEO owns and the total compensation (the sum of total direct compensation and the option portfolio of the CEO), refocusing firms have lower pay-to-performance sensitivity and higher pay-to-volatility sensitivity than the firms that stay diversified. If higher agency costs drive firms to diversify, it should be the firms with better governance structure that choose to refocus. The evidence from the comparison of governance characteristics of refocusing firms and firms that stay diversified do not support the agency costs theory.

After refocusing events, the number of segments of refocusing firms decreases from two to one. The refocusing firms also improve their performance significantly after refocusing events. The mean (median) of the excess value increases from 0.003 (0.017) before they refocus to 0.160 (0.160) after they refocus. There are no significant changes in other firm characteristics and governance characteristics. The pay-to-performance sensitivity and the pay-to-volatility sensitivity do not change either. Lower profitability (*EBIT/SALES*) and higher capital expenditure intensity (*CAPX/SALES*) are the only factors that predict firms' probability to refocus. This is consistent with the findings from the univariate test that poorly performed firms may use refocusing as one way to improve their performance. However, agency costs theory cannot explain why firms choose to refocus. The changes in excess value around refocusing events are not related to any of the firm characteristics or governance characteristics.[18]

8. Conclusions

[18] When I include the G-index in the regressions, I find that it is negatively related to the change in excess value. This means that the lower the G-index, which represents stronger shareholder rights, the better the improvements in excess value after refocusing events.

Agency costs are often cited as a reason for firms' decision to diversify. However, most of the literature simply compares one or several aspects of the corporate governance structure of diversified and focused firms. In this paper, I examine this issue by looking at the governance characteristics before firms diversify. By comparing single segment firms that diversify in the next year with those that stay focused, my results are not affected by systematic differences in the characteristics of diversified firms and focused firms. Previous studies show that industry factors affect both firms' decision to diversify and the corporate governance characteristics of firms. I separate the agency costs explanation from these industry factors by using a size-matched sample of firms that stay focused and operate in the same industry as the diversifying firms.

My empirical analysis indicates that firms with more outsiders on board and smaller board size are more likely to diversify, which is inconsistent with the agency costs explanation of why firms choose to diversify. Furthermore, I find that the CEO pay-to-performance sensitivity in diversifying firms is also not significantly different from that for CEOs in firms that remain focused. The governance characteristics cannot explain why firms choose to diversify and are not related to the changes in excess value around diversification. Furthermore, though some governance characteristics are related to the cumulative abnormal returns around diversification events, these relationships are often inconsistent with the agency costs theory. In sum, I find little support for the hypothesis that agency costs can explain firms' decision to diversify. Finally, my results for firms that choose to refocus are also inconsistent with the agency costs hypothesis.

The main contribution of my paper is that it clearly illustrates the pitfalls in comparing the governance characteristics of multiple segment firms with those of single segment firms in order to investigate whether agency costs prompt firms to diversify. More specifically, even if

governance characteristics are related to the probability of firms being diversified, this relation does not shed any light on the question of whether agency costs prompt firms to diversify from single segment to multiple segment firms. Therefore, simply comparing the governance characteristics of diversified firms and focused firms may give us unreliable inferences on what drives firms to diversify. By using more appropriate benchmarks, I find little evidence to support agency costs explanation for the diversification decision. These results are consistent with recent research that questions the very existence of a diversification discount.[19] Finding scant support for agency costs explanation for the decision to diversify is consistent with the notion that the decision to diversify is not synonymous with value destruction.

[19] See, for example, Campa and Kedia (2002), Graham, Lemmon, and Wolf (2002), and Villalonga (2004).

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Table 1
Summary Statistics for Multiple Segment Firms and Single Segment Firms

This table displays descriptive statistics for the multiple segment firms and single segment firms. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. *NUMSEG* is the number of business segments in which a firm operates as a measure of firm diversification. *ASSETS* is the book value of total assets. *SALES* is the book value of total sales. *EBIT/SALES* is the ratio of EBIT to total sales, *NPM* is the ratio of NI to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *CAPX/TA* is the ratio of capital expenditures to total assets, *LEVER* is the ratio of total debt to total assets, *LTDLEVER* is the ratio of long-term debt to total assets, *R&D/SALES* is the ratio of R&D expenditures to total sales, *FCF* is computed following Lehn and Pousen (1989), and *TOBINQ* is the market to book ratio of the firm. The table includes 9,596 firm-year observations from 1992 through 2003. 5,571 of them are single segment firms. The remaining 4,025 are multiple segment firms.

Variable	Multiple Segment Firms (N=4,025)			Single Segment Firms (N=5,571)			Difference (Multiple – Single)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-Stat	Z-Stat
EXVAL	0.006	-0.003	0.548	0.175	0.132	0.549	-14.88[a]	-14.69[a]
NUMSEG	3.025	3.000	1.120	1.000	1.000	0.000	114.78[a]	93.81[a]
ASSETS ($ m.)	4362.060	1590.560	8602.470	2215.880	644.316	5079.560	14.15[a]	28.04[a]
SALES ($ m.)	4091.190	1577.090	10162.910	2172.840	649.558	5045.840	11.03[a]	27.66[a]
EBIT/SALES	0.093	0.093	0.107	0.088	0.097	0.234	1.18	-3.86[a]
NPM	0.028	0.043	0.178	0.008	0.051	0.610	2.30[b]	-7.17[a]
CAPX/SALES	0.074	0.046	0.097	0.105	0.053	0.171	-11.04[a]	-7.15[a]
CAPX/TA	0.059	0.049	0.046	0.077	0.058	0.067	-15.39[a]	-11.35[a]
LEVER	0.462	0.461	0.173	0.411	0.403	0.202	13.10[a]	16.06[a]
LTDLEVER	0.225	0.223	0.151	0.183	0.148	0.183	12.31[a]	16.27[a]
R&D/SALES	0.023	0.000	0.060	0.056	0.000	0.150	-14.98[a]	-3.20[a]
FCF	0.082	0.075	0.192	0.091	0.092	0.119	-2.59[a]	-13.48[a]
TOBINQ	1.367	1.104	0.900	1.924	1.439	1.573	-21.90[a]	-20.70[a]

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 2
Summary Statistics of Governance Characteristics for the Single Segment and Multiple Segment Firms

This table displays summary statistics of the governance characteristics for firms split by multiple segment firms and single segment firms. *TCC, BLK_VALUE, SHROWN,* and *SOPTVAL* are from the Compustat ExecuComp dataset. *TCC* is the total of *SALARY* and *BONUS*; *BLK_VALUE* is the Black-Scholes value of options granted; *OPTPORT* is the Black-Scholes value of options portfolio owned by the CEO; *SHROWN* is the dollar amount of company stock owned by CEO, *SOPTVAL* is the dollar value of the options granted as valued by company; *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER_SUM, INSIDER, BOARDSIZE, DUAL, CEOOWNPC, INSTOWNPC, BLOCKOWNPC, INSOWNPC,* and *DIROWNPC* are from the Compact Disclosure dataset. *INSIDER_SUM* is the number of insiders on board; *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC* , *INSTOWNPC, BLOCKOWNPC, INSOWNPC,* and *DIROWNPC* are percentage ownership by CEO, institutions, blockholders, insiders, and directors, respectively. The table includes 9,596 firm-year observations from 1992 through 2003. 5,571 of these belong to single segment firms and the remaining 4,025 belong to multiple segment firms. The difference in mean (median) is conducted using a t-test (Wilcoxon two-sample z-test).

Year	Multiple Segment Firms (N=4,025)			Single Segment Firms (N=5,571)			Difference (Multiple – Single)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median
TCC ($000)	1201.500	954.395	944.534	916.205	678.667	1024.590	14.09[a]	21.97[a]
BLK_VALUE ($)	1764.240	511.514	5448.290	1971.720	410.087	11481.710	-1.18	3.78[a]
OPTPORT ($000)	13052.670	4333.310	39304.730	13449.140	3985.940	40170.410	-0.48	3.12[a]
EBP	0.714	0.816	0.278	0.714	0.845	0.310	0.08	-5.97[a]
SHROWN	1332.830	170.447	7391.750	1877.170	225.190	8863.920	-3.24[a]	-5.48[a]
CEOOWNPC (%)	4.912	1.360	8.216	5.921	2.090	9.062	-3.97[a]	-6.30[a]
SOPTVAL ($)	2083.930	657.827	5160.900	2049.570	480.568	10531.480	0.21	6.18[a]
INSIDER_SUM	2.221	2.000	1.421	2.245	2.000	1.326	-0.81	-2.66[a]
INSIDER	0.247	0.200	0.179	0.294	0.250	0.189	-12.41[a]	-16.23[a]
BOARDSIZE	9.829	10.000	3.157	8.425	8.000	3.140	21.57[a]	23.75[a]
DUAL	0.713	1.000	0.452	0.634	1.000	0.482	8.06[a]	7.95[a]
INSTOWNPC (%)	61.174	63.260	19.928	58.701	61.240	22.459	5.66[a]	4.70[a]
BLOCKOWNPC (%)	29.284	26.235	23.076	33.315	30.430	24.929	-8.12[a]	-7.65[a]
INSOWNPC (%)	7.068	2.050	12.534	12.369	5.275	16.926	-17.51[a]	-19.65[a]
DIROWNPC (%)	0.021	0.004	0.058	0.128	0.008	6.417	-1.20	-15.07[a]

[a]:Significant at 1% level;. [b]: Significant at 5% level;. [c]:Significant at 10% level

Table 3
OLS Regression Comparing the Sensitivity of Compensation to Firm Performance in Multiple Segment Firms and Single Segment Firms

This table compares the sensitivity of compensation to firm performance in multiple segment firms and single segment firms. The first difference in salary and bonus is the annual change of CEO salary and bonus expressed in 1992 dollars. The first difference in value of options is the annual change of Black-Scholes value of option portfolio owned by the CEO expressed in 1992 dollars. The first difference in total compensation is the annual change of CEO salary, bonus, and Black-Scholes value of option portfolio owned by the CEO expressed in 1992 dollars. The independent variables include a dummy equal to one for multi-segment firms, the first difference in the market value of equity, the first difference in the volatility of the underlying stock, an interactive term between the dummy and the first difference of market value of equity, and an interactive term between the dummy and the first difference in the volatility of the underlying stock. The sample consists of 9,596 firm year observations from 1992-2003. 4,025 of these belong to multi-segment firms, and 5,571 of these belong to single segment firms.

Variable	First Difference in Salary and Bonus	First Difference in Value of Options	First Difference in Total Compensation
	(1)	(2)	(3)
Intercept	-299.522[a] (-5.21)	-66.825 (-0.03)	-366.347 (-0.19)
Multi-segment Indicator	-6.724 (-0.29)	-545.060 (-0.70)	-551.784 (0.71)
LSIZE	42.704[a] (5.21)	53.452 (0.19)	96.157 (0.35)
First Difference in Market Value of Equity	0.052[a] (20.19)	2.942[a] (34.23)	2.993[a] (34.86)
First Difference in Market Value of Equity Interacted with Multi-segment Indicator	-0.028[a] (-9.07)	-1.982[a] (-19.21)	-2.010[a] (-19.49)
First Difference in Volatility	-546.626[a] (-5.03)	11152[a] (3.07)	10605[a] (2.92)
First Difference in Volatility Interacted with Multi-segment Indicator	-40.826 (-0.22)	880.198 (0.14)	839.372 (0.14)
R^2	0.102	0.179	0.185

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 4
Logistic Regressions of Firms being a Multi-segment Firm

This table contains results from the logistic regression of firms being a multiple segment firm on the corporate governance characteristics. The table includes 9,566 firm-year observations from 1992 through 2003. 5,571 of these belong to single segment firms and the remaining 4,025 belong to multiple segment firms. The dependent variable equals to one if the firm is a diversified firm. *LSIZE* is the logarithm of book value of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, and *LEVER* is the ratio of total debt to total assets, *TOBINQ* is the market to book ratio of the firm, *TCC* is from the Compustat ExecuComp dataset. *OPTPORT* is the Black-Scholes value of option portfolio owned by the CEO. *LTOTAL* is the natural logarithm of *TCC*, and *OPTPORT*. *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, and *BLOCKOWNPC* are from the Compact Disclosure dataset. *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC*, *INSTOWNPC* and *BLOCKOWNPC* are percentage ownership by CEOs, institutions and blockholders, respectively.

Variable	(1)	(2)	(3)	(4)
Intercept	-2.394[a] (0.00)	-2.345[a] (0.00)	-2.278[a] (0.00)	-2.209[a] (0.00)
LSIZE	0.411[a] (0.00)	0.329[a] (0.00)	0.348[a] (0.00)	0.278[a] (0.00)
EBIT/SALES	0.167 (0.27)	0.110 (0.45)	0.248 (0.20)	0.209 (0.26)
CAPX/SALES	-2.572[a] (0.00)	-2.553[a] (0.00)	-3.161[a] (0.00)	-3.111[a] (0.00)
LEVER	0.203 (0.11)	0.207 (0.11)	0.500[a] (0.00)	0.459[a] (0.00)
TOBINQ	-0.364[a] (0.00)	-0.350[a] (0.00)	-0.400[a] (0.00)	-0.390[a] (0.00)
LTOTAL	-0.030 (0.35)			0.002 (0.97)
EBP	0.200 (0.14)			-0.111 (0.54)
INSIDER		-0.561[a] (0.00)		-0.611[a] (0.00)
BOARDSIZE		0.047[a] (0.00)		0.047[a] (0.00)
DUAL		0.168[a] (0.00)		0.213[a] (0.00)
CEOOWNPC			-1.652[a] (0.00)	-1.425[b] (0.02)
INSTOWNPC			0.005[a] (0.00)	0.005[a] (0.00)
BLOCKOWNPC			-0.002[c] (0.07)	-0.002 (0.19)
CHI-SQUARE	977.338 (0.00)	990.970 (0.00)	646.576 (0.00)	686.986 (0.00)

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 5
Summary Statistics for the Firms that Choose to Diversify and for All Firms that Choose to Remain Focused

This table displays descriptive statistics for the firms that choose to diversity and all firms that choose to remain focused. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. *NUMSEG* is the number of business segments in which a firm operates as a measure of firm diversification. *ASSETS* is the book value of total assets. *SALES* is the book value of total sales. *EBIT/SALES* is the ratio of EBIT to total sales, *NPM* is the ratio of NI to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *CAPX/TA* is the ratio of capital expenditures to total assets, *LEVER* is the ratio of total debt to total assets, *LTDLEVER* is the ratio of long-term debt to total assets, *R&D/SALES* is the ratio of R&D expenditures to total sales, *FCF* is computed following Lehn and Pousen (1989), and *TOBINQ* is the market to book ratio of the firm. The table includes 5,177 firm-year observations from 1992 through 2003. 229 of these belong to diversifying firms, and the remaining 4,948 belong to all firms that choose to stay focused.

Variable	Diversify (N=229)			Stay Focus (N=4,948)			Difference (Diversify – Stay Focus)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-Stat	Z-Stat
EXVAL	0.169	0.083	0.564	0.183	0.143	0.544	-0.37	-0.50
ASSETS ($ m.)	2815.200	919.349	5501.140	2236.710	645.990	5111.940	1.67[c]	3.63[a]
SALES ($ m.)	2999.110	925.070	7432.650	2206.350	648.897	5048.230	1.60	3.41[a]
EBIT/SALES	0.096	0.098	0.127	0.092	0.098	0.233	0.46	-0.48
NPM	0.021	0.048	0.158	0.012	0.052	0.633	0.59	-1.92[c]
CAPX/SALES	0.087	0.051	0.133	0.106	0.054	0.173	-2.07[b]	-0.96
CAPX/TA	0.067	0.053	0.051	0.079	0.059	0.068	-3.37[a]	-2.12[b]
LEVER	0.444	0.452	0.185	0.409	0.397	0.202	2.61[a]	3.56[a]
LTDLEVER	0.208	0.215	0.166	0.182	0.146	0.184	2.07[b]	2.90[a]
R&D/SALES	0.033	0.000	0.101	0.054	0.000	0.142	-2.96[a]	-1.77[c]
FCF	0.084	0.087	0.067	0.094	0.093	0.118	-1.97[c]	-2.12[b]
TOBINQ	1.635	1.256	1.121	1.934	1.455	1.578	-3.86[a]	-3.06[a]

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 6

Summary Statistics of Governance Characteristics for the Firms that Choose to Diversify and for All Firms that Choose to Remain Focused

This table displays summary statistics of the governance characteristics for firms split by diversifying firms and all firms that stay focused. *TCC*, *BLK_VALUE*, *SHROWN*, and *SOPTVAL* are from the Compustat ExecuComp dataset. *TCC* is the total of *SALARY* and *BONUS*; *BLK_VALUE* is the Black-Scholes value of options granted; *OPTPORT* is the Black-Scholes value of options portfolio owned by the CEO; *SHROWN* is the dollar amount of company stock owned by CEO, *SOPTVAL* is the dollar value of the options granted as valued by company; *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER_SUM*, *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, *BLOCKOWNPC*, *INSOWNPC*, and *DIROWNPC* are from the Compact Disclosure dataset. *INSIDER_SUM* is the number of insiders on board; *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC* , *INSTOWNPC*, *BLOCKOWNPC*, *INSOWNPC*, and *DIROWNPC* are percentage ownership by CEO, institutions, blockholders, insiders, and directors, respectively. The difference in mean (median) is conducted using a t-test (Wilcoxon two-sample z-test). The table includes 5,177 firm-year observations from 1992 through 2003. 229 of these belong to diversifying firms, and the remaining 4,948 belong to all firms that stay focused. The difference in mean (median) is conducted using a t-test (Wilcoxon two-sample z-test).

Variable	Diversify (N=229)			Stay Focus (N=4948)			Difference (Diversify – Stay Focus)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-Stat	Z-Stat
TCC ($000)	1200.090	800.000	2984.380	907.241	679.793	839.941	1.48	3.38[a]
BLK_VALUE ($)	1466.610	399.177	3738.240	2003.960	396.522	12102.710	-1.78	-0.85
OPTPORT ($000)	15194.160	3459.740	48950.570	13469.040	4010.790	40433.230	0.53	-0.49
EBP	0.698	0.816	0.310	0.713	0.845	0.312	-0.71	-1.46
SHROWN	2846.490	191.683	20810.540	1842.870	229.425	8026.960	0.72	-0.54
CEOOWNPC (%)	6.483	1.980	8.994	5.960	2.100	9.086	0.61	0.28
SOPTVAL ($)	1548.220	431.601	3510.460	2091.790	478.306	11109.430	-1.93[c]	-0.88
INSIDER_SUM	2.310	2.000	1.272	2.256	2.000	1.333	0.60	0.82
INSIDER	0.313	0.250	0.228	0.295	0.250	0.189	1.19	-0.07
BOARDSIZE	8.786	9.000	3.472	8.448	8.000	3.145	1.44	2.12[b]
DUAL	0.662	1.000	0.474	0.636	1.000	0.481	0.80	0.80
INSTOWNPC (%)	58.581	60.310	21.580	58.908	61.600	22.422	-0.21	-0.33
BLOCKOWNPC (%)	36.148	31.410	25.059	32.911	30.060	24.899	1.91[c]	1.84[c]
INSOWNPC (%)	11.087	3.970	17.565	12.254	5.350	16.652	-1.03	-2.07[b]
DIROWNPC (%)	0.043	0.006	0.092	0.139	0.008	6.801	-0.96	-0.86

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 7
OLS Regression Comparing the Sensitivity of Compensation to Firm Performance in Diversifying Firms and All Firms that Remain Focused

This table compares the sensitivity of compensation to firm performance in diversifying firms and all firms that choose to stay focused. The first difference in salary and bonus is the annual change of CEO salary and bonus expressed in 1992 dollars. The first difference in value of options is the annual change of Black-Scholes value of option portfolio owned by the CEO expressed in 1992 dollars. The first difference in total compensation is the annual change of CEO salary, bonus, and Black-Scholes value of option portfolio owned by the CEO expressed in 1992 dollars. The independent variables include a dummy equal to one for diversifying firms, the first difference in the market value of equity, the first difference in the volatility of the underlying stock, an interactive term between the dummy and the first difference of market value of equity, and an interactive term between the dummy and the first difference in the volatility of the underlying stock. The sample consists of 5,177 firm year observations from 1992-2003. 229 of these belong to diversifying firms, and 4,948 of these belong to all firms that stay focused.

Variable	First Difference in Salary and Bonus	First Difference in Value of Options	First Difference in Total Compensation
	(1)	(2)	(3)
Intercept	-294.231a (-3.79)	2204.127 (0.71)	1909.896 (0.62)
Diversifying Indicator	308.822[a] (4.10)	-6738.766[b] (-2.24)	-6429.944[b] (-2.14)
LSIZE	39.805a (3.54)	-241.456 (-0.54)	-201.652 (-0.45)
First Difference in Market Value of Equity	0.045[a] (15.79)	3.340[a] (29.08)	3.385[a] (29.56)
First Difference in Market Value of Equity Interacted with Diversifying Dummy	0.027[a] (2.86)	-0.499 (-1.30)	-0.471 (-1.23)
First Difference in Volatility	-482.289[a] (-4.26)	12714[a] (2.81)	12232[a] (2.71)
First Difference in Volatility Interacted with Multi-segment Indicator	-1138.900 (-1.31)	-33867 (-0.98)	-35006 (-1.01)
R^2	0.109	0.207	0.213

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 8
Logistic Regressions of Firms that Choose to Diversify (Full Sample)

This table contains results from the logistic regression of firms that choose to diversify on the corporate governance characteristics. The table includes 5,177 firm-year observations from 1992 through 2003. 229 of these belong to diversifying firms, and the remaining 4,948 belong to all firms that choose to stay focused. The dependent variable equals to one if the firm is a diversified firm. *LSIZE* is the logarithm of book value of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, and *LEVER* is the ratio of total debt to total assets, *TOBINQ* is the market to book ratio of the firm, *TCC* is from the Compustat ExecuComp dataset. *OPTPORT* is the Black-Scholes value of option portfolio owned by the CEO. *LTOTAL* is the natural logarithm of *TCC*, and *OPTPORT*. *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, and *BLOCKOWNPC* are from the Compact Disclosure dataset. *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC*, *INSTOWNPC* and *BLOCKOWNPC* are percentage ownership by CEOs, institutions and blockholders, respectively.

Variable	(1)	(2)	(3)	(4)
Intercept	-4.099[a] (0.00)	-4.070[a] (0.00)	-4.036[a] (0.00)	-4.794[a] (0.00)
LSIZE	0.084 (0.19)	0.129[b] (0.02)	0.173[a] (0.00)	0.121 (0.18)
EBIT/SALES	0.151 (0.72)	0.157 (0.70)	0.159 (0.73)	0.082 (0.84)
CAPX/SALES	-0.962[c] (0.08)	-1.060[c] (0.06)	-1.080 (0.11)	-1.131 (0.10)
LEVER	0.466 (0.19)	0.353 (0.34)	0.325 (0.47)	0.277 (0.55)
TOBINQ	-0.182[a] (0.00)	-0.139[b] (0.02)	-0.165[b] (0.03)	-0.182[b] (0.03)
LTOTAL	0.118 (0.23)			0.065 (0.61)
EBP	-0.472 (0.25)			-0.111 (0.83)
INSIDER		0.640[c] (0.09)		0.804[c] (0.09)
BOARDSIZE		0.011 (0.68)		0.032 (0.27)
DUAL		0.091 (0.54)		0.241 (0.19)
CEOOWNPC			0.178 (0.65)	0.153 (0.73)
INSTOWNPC			-0.005 (0.21)	-0.005 (0.28)
BLOCKOWNPC			0.011[a] (0.00)	0.011[a] (0.00)
CHI-SQUARE	23.998 (0.00)	24.604 (0.00)	29.565 (0.00)	33.314 (0.00)

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 9
Summary Statistics for the Firms that Choose to Diversify and for Matched Firms that Choose to Remain Focused

This table displays descriptive statistics for the firms that choose to diversity and matched firms that choose to remain focused. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. *NUMSEG* is the number of business segments in which a firm operates as a measure of firm diversification. *ASSETS* is the book value of total assets. *SALES* is the book value of total sales. *EBIT/SALES* is the ratio of EBIT to total sales, *NPM* is the ratio of NI to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *CAPX/TA* is the ratio of capital expenditures to total assets, *LEVER* is the ratio of total debt to total assets, *LTDLEVER* is the ratio of long-term debt to total assets, *R&D/SALES* is the ratio of R&D expenditures to total sales, *FCF* is computed following Lehn and Pousen (1989), and *TOBINQ* is the market to book ratio of the firm. The table includes 458 firm-year observations from 1992 through 2003. 229 of these belong to diversifying firms, and the remaining 229 belong to matched firms that stay focused.

Variable	Diversify (N=229)			Stay Focus (N=229)			Difference (Diversify – Stay Focus)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-Stat	Z-Stat
EXVAL	0.169	0.083	0.564	0.113	0.109	0.560	1.06	-0.71
ASSETS ($ m.)	2815.200	919.349	5501.140	2710.900	941.200	4986.280	0.21	0.01
SALES ($ m.)	2999.110	925.070	7432.650	2500.160	933.982	3813.950	0.90	0.12
EBIT/SALES	0.096	0.098	0.127	0.091	0.098	0.189	0.36	0.23
NPM	0.021	0.048	0.158	0.008	0.050	0.322	0.53	0.65
CAPX/SALES	0.087	0.051	0.133	0.102	0.050	0.176	-1.01	-0.14
CAPX/TA	0.067	0.053	0.051	0.073	0.049	0.065	-1.10	-0.04
LEVER	0.444	0.452	0.185	0.426	0.427	0.190	1.04	-0.97
LTDLEVER	0.208	0.215	0.166	0.196	0.165	0.170	0.74	-0.74
R&D/SALES	0.033	0.000	0.101	0.063	0.000	0.170	-2.28[b]	1.20
FCF	0.084	0.087	0.067	0.090	0.087	0.131	-0.61	-0.62
TOBINQ	1.635	1.256	1.121	1.921	1.442	1.675	-2.15[b]	1.52

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 10
Summary Statistics of Governance Characteristics for the Firms that Choose to Diversify and for the Matched Firms that Choose to Remain Focused

This table displays summary statistics of the governance characteristics for firms split by diversifying firms and matched firms that stay focused. *TCC*, *BLK_VALUE*, *SHROWN*, and *SOPTVAL* are from the Compustat ExecuComp dataset. *TCC* is the total of *SALARY* and *BONUS*; *BLK_VALUE* is the Black-Scholes value of options granted; *OPTPORT* is the Black-Scholes value of options portfolio owned by the CEO; *SHROWN* is the dollar amount of company stock owned by CEO, *SOPTVAL* is the dollar value of the options granted as valued by company; *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER_SUM*, *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, *BLOCKOWNPC*, *INSOWNPC*, and *DIROWNPC* are from the Compact Disclosure dataset. *INSIDER_SUM* is the number of insiders on board; *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC* , *INSTOWNPC*, *BLOCKOWNPC*, *INSOWNPC*, and *DIROWNPC* are percentage ownership by CEO, institutions, blockholders, insiders, and directors, respectively. The table includes 458 firm-year observations from 1992 through 2003. 229 of these belong to diversifying firms, and the remaining 229 belong to matched firms that stay focused. The difference in mean (median) is conducted using a t-test (Wilcoxon two-sample z-test).

Variable	Diversify (N=229)			Stay Focus (N=229)			Difference (Diversify – Stay Focus)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-Stat	Z-Stat
TCC ($000)	1200.090	800.000	2984.380	931.692	725.400	771.553	1.32	1.71[c]
BLK_VALUE ($)	1466.610	399.177	3738.240	2692.780	447.644	6691.650	-2.42[b]	1.58
OPTPORT ($000)	15194.160	3459.740	48950.570	17201.840	4568.990	40574.240	-0.48	1.09
EBP	0.698	0.816	0.310	0.717	0.854	0.312	-0.66	-1.64
SHROWN	2846.490	191.683	20810.540	2705.260	346.435	8194.770	0.10	1.53
CEOOWNPC	6.483	1.980	8.994	6.953	2.800	9.039	-0.40	-1.03
SOPTVAL ($)	1548.220	431.601	3510.460	2501.720	559.393	5578.110	-2.18[b]	-1.49
INSIDER_SUM	2.310	2.000	1.272	2.507	2.000	1.369	-1.59	1.46
INSIDER	0.313	0.250	0.228	0.310	0.273	0.191	0.14	-1.01
BOARDSIZE	8.786	9.000	3.472	9.135	9.000	3.349	-1.10	0.88
DUAL	0.662	1.000	0.474	0.670	1.000	0.471	-0.17	0.17
INSTOWNPC (%)	58.581	60.310	21.580	59.794	63.290	21.208	-0.60	-0.70
BLOCKOWNPC (%)	36.148	31.410	25.059	36.739	32.960	25.035	-0.25	-0.31
INSOWNPC (%)	11.087	3.970	17.565	12.011	4.980	16.395	-0.58	-0.96
DIROWNPC	0.043	0.006	0.092	0.038	0.007	0.075	0.63	-0.24

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 11
OLS Regression Comparing the Sensitivity of Compensation to Firm Performance in Diversifying Firms and Matched Firms that Remain Focused

This table compares the sensitivity of compensation to firm performance in diversifying firms and matched firms that choose to stay focused. The first difference in salary and bonus is the annual change of CEO salary and bonus expressed in 1992 dollars. The first difference in value of options is the annual change of Black-Scholes value of option portfolio owned by the CEO expressed in 1992 dollars. The first difference in total compensation is the annual change of CEO salary, bonus, and Black-Scholes value of option portfolio owned by the CEO expressed in 1992 dollars. The independent variables include a dummy equal to one for diversifying firms, the first difference in the market value of equity, the first difference in the volatility of the underlying stock, an interactive term between the dummy and the first difference of market value of equity, and an interactive term between the dummy and the first difference in the volatility of the underlying stock. The sample consists of 458 firm year observations from 1992-2003. 229 of these belong to diversifying firms, and 229 of these belong to matched firms that stay focused and operate in the same industry and about similar size of the diversifying firms.

Variable	First Difference in Salary and Bonus	First Difference in Value of Options	First Difference in Total Compensation
	(1)	(2)	(3)
Intercept	-1110.174[c] (-1.68)	38333[b] (2.37)	37223[b] (2.36)
Diversifying Indicator	376.690 (1.58)	-8275.360 (-1.43)	-7898.670 (-1.40)
LSIZE	146.991 (1.61)	-5197.960[b] (-2.34)	-5050.969[b] (-2.33)
First Difference in Market Value of Equity	0.031 (0.82)	3.294[a] (3.52)	3.325[a] (3.64)
First Difference in Market Value of Equity Interacted with Diversifying Dummy	0.036 (0.83)	-0.182 (-0.17)	-0.146 (-0.14)
First Difference in Volatility	-517.658 (-0.32)	12409 (0.31)	11892 (0.31)
First Difference in Volatility Interacted with Multi-segment Indicator	-1231.246 (-0.48)	-27656 (-0.44)	-28887 (-0.48)
R^2	0.068	0.136	0.146

[a]: Significant at 1% level;. [b]: Significant at 5% level;· [c]: Significant at 10% level.
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Table 12
Logistic Regressions of Firms that Choose to Diversify (Matched Sample)

This table contains results from the logistic regression of firms that choose to diversify on the corporate governance characteristics. The table includes 458 firm-year observations from 1992 through 2003. 229 of these belong to diversifying firms, and the remaining 229 belong to matched firms that stay focused. The dependent variable equals to one if the firm is a diversified firm. *LSIZE* is the logarithm of book value of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, and *LEVER* is the ratio of total debt to total assets, *TOBINQ* is the market to book ratio of the firm, *TCC* is from the Compustat ExecuComp dataset. *OPTPORT* is the Black-Scholes value of option portfolio owned by the CEO. *LTOTAL* is the natural logarithm of *TCC*, and *OPTPORT*. *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, and *BLOCKOWNPC* are from the Compact Disclosure dataset. *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC*, *INSTOWNPC* and *BLOCKOWNPC* are percentage ownership by CEOs, institutions and blockholders, respectively.

Variable	(1)	(2)	(3)	(4)
LSIZE	2.429 (0.92)	2.440 (0.91)	5.612 (1.41)	5.835 (1.41)
EBIT/SALES	0.628 (0.95)	0.667 (0.99)	0.518 (0.57)	0.422 (0.43)
CAPX/SALES	-0.958 (-1.25)	-0.925 (-1.22)	-0.251 (-0.25)	-0.895 (-0.85)
LEVER	0.607 (0.86)	0.381 (0.54)	2.133[c] (1.87)	2.590[c] (2.03)
TOBINQ	-0.223[b] (-2.28)	-0.200[b] (-2.33)	-0.130 (-1.00)	-0.071 (-0.44)
LTOTAL	0.173 (1.14)			-0.248 (-0.95)
EBP	-0.792 (-1.23)			0.530 (0.49)
INSIDER		-0.482 (-0.80)		-2.035[c] (-1.70)
BOARDSIZE		-0.067 (-1.63)		-0.157[b] (-2.14)
DUAL		0.014 (0.06)		0.172 (0.50)
CEOOWNPC			-1.561 (-0.62)	-2.217 (-0.79)
INSTOWNPC			-0.014 (-1.50)	-0.016 (-1.56)
BLOCKOWNPC			0.008 (1.25)	0.007 (1.04)
CHI-SQUARE	11.59 (0.12)	11.65 (0.17)	14.05 (0.08)	19.35 (0.11)

[a]: Significant at 1% level;. [b]: Significant at 5% level; [c]: Significant at 10% level.

Table 13
Change in Excess Value around Diversification and the Corporate Governance Characteristics

This table contains results from the regression of change in excess value around diversification on the corporate governance characteristics. The dependent variable is the change in excess value of diversifying firms around diversification for OLS regressions. *LSIZE* is the logarithm of book value of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, and *LEVER* is the ratio of total debt to total assets, *TCC* is from the Compustat ExecuComp dataset. *OPTPORT* is the Black-Scholes value of option portfolio owned by the CEO. *LTOTAL* is the natural logarithm of *TCC*, and *OPTPORT*. *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, and *BLOCKOWNPC* are from the Compact Disclosure dataset. *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC*, *INSTOWNPC* and *BLOCKOWNPC* are percentage ownership by CEOs, institutions and blockholders, respectively.

Variable	(1) OLS Regression
Intercept	0.805[c] (1.84)
LSIZE	-0.029 (-0.63)
EBIT/SALES	0.077 (0.20)
CAPX/SALES	0.408 (0.89)
LEVER	-0.118 (-0.42)
LTOTAL	-0.038 (-0.56)
EBP	-0.274 (-0.92)
INSIDER	0.047 (0.19)
BOARDSIZE	-0.002 (-0.13)
DUAL	-0.057 (-0.55)
CEOOWNPC	0.190 (0.28)
INSTOWNPC	0.001 (0.35)
BLOCKOWNPC	-0.003 (-1.60)
N	113
R^2	0.118

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Table 14
Cumulative Abnormal Returns around Diversification and the Corporate Governance Characteristics

This table contains results from the regression of cumulative abnormal returns (CARs) around diversification on the corporate governance characteristics. The dependent variable is the CARs of different windows. *LSIZE* is the logarithm of book value of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, and *LEVER* is the ratio of total debt to total assets, *TCC* is from the Compustat ExecuComp dataset. *OPTPORT* is the Black-Scholes value of option portfolio owned by the CEO. *LTOTAL* is the natural logarithm of *TCC*, and *OPTPORT*. *EBP* is the ratio of *OPTPORT* to the sum of *TCC* and *OPTPORT*. *INSIDER*, *BOARDSIZE*, *DUAL*, *CEOOWNPC*, *INSTOWNPC*, and *BLOCKOWNPC* are from the Compact Disclosure dataset. *INSIDER* is the percentage of insiders on board; *BOARDSIZE* is the board size; *DUAL* is the CEO is also the Chair of the Board; and *CEOOWNPC*, *INSTOWNPC* and *BLOCKOWNPC* are percentage ownership by CEOs, institutions and blockholders, respectively. *OFFERSTOCK* is a dummy variable that equals one if the offer is not cash only, *RELATED* is a dummy variable that is one if the first three digit of first SIC code of the bidder is the same as that of the target.

Variable	(-10,+1)	(0,1)	(-5,+5)	Moving
Intercept	-0.048 (-0.66)	0.017 (0.39)	-0.021 (-0.30)	0.206 (1.38)
LSIZE	0.004 (0.56)	-0.002 (-0.50)	0.001 (0.13)	0.006 (0.35)
EBIT/SALES	0.049 (0.70)	0.010 (0.23)	-0.077 (-1.11)	0.040 (0.28)
CAPX/SALES	-0.091[a] (-2.95)	-0.020 (-1.07)	-0.048 (-1.59)	-0.017 (-0.27)
LEVER	-0.056 (-0.91)	-0.037 (-1.03)	-0.033 (-0.56)	-0.201 (-1.64)
LTOTAL	0.008 (0.77)	0.011 (1.63)	0.020[c] (1.87)	-0.014 (-0.66)
EBP	-0.013 (-0.21)	-0.061[c] (-1.66)	-0.110[c] (-1.81)	0.154 (1.23)
INSIDER	-0.011 (-0.25)	-0.021 (-0.76)	-0.063 (-1.37)	-0.089 (-0.92)
BOARDSIZE	-0.003 (-1.06)	-0.003 (-1.49)	-0.006[c] (-1.96)	-0.011[c] (-1.74)
DUAL	0.026 (1.44)	0.013 (1.20)	0.026 (1.49)	0.046 (1.24)
CEOOWNPC	0.058 (0.30)	-0.009 (-0.08)	0.155 (0.81)	-0.182 (-0.47)
INSTOWNPC	-0.000 (-0.62)	-0.000 (-0.21)	-0.000 (-0.06)	-0.001 (-0.91)
BLOCKOWNPC	0.000 (0.50)	-0.000 (-0.12)	0.000 (0.54)	-0.000 (-0.25)
OFFERSTOCK	0.003 (0.17)	0.002 (0.18)	-0.008 (-0.50)	0.037 (1.20)
RELATED	0.011 (0.64)	0.009 (0.92)	0.001 (0.07)	0.027 (0.77)
N	204	204	204	199

R^2	0.140	0.074	0.066	0.084

[a]: Significant at 1% level;. [b]: Significant at 5% level;. [c]: Significant at 10% level.

Internal Capital Markets, Firm Risk, Leverage, and Corporate Diversification

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Abstract

The extant literature has partly attributed the diversification discount to inefficient internal capital markets. Another competing explanation for the diversification discount is related to a reduction in firm risk, since it causes a transfer of wealth from shareholders to bondholders for levered conglomerates. In this paper, I argue that the diversity in investment opportunities, which causes internal capital market inefficiency, may be correlated with firm risk. I examine internal capital market inefficiency and firm risk/leverage simultaneously as determinants of the diversification discount. I find that relative to the coinsurance effect, internal capital market inefficiency is more important in explaining the excess value of diversified firms. To increase the power of my tests, I also examine sub-samples of diversified firms, such as all-equity firms and pseudo conglomerates. Another issue I investigate in this paper is how the level of diversification affects firm value. The level of diversification may be related to both diversity in investment opportunities and firm risk. Even after controlling for firm risk and diversity in investment opportunities, I find that the more diversified a firm is, the lower value it has. It seems that diversification destroys value in ways other than through either inefficient internal capital markets or wealth transfer from shareholders due to lower firm risk. Although the risk of some firms decreases after diversification, there are other firms that become riskier after diversification. In such cases, there should be a transfer of wealth from bondholders to shareholders for levered firms. Therefore, in this paper, I also test how leverage affects shareholders' value differently depending on whether there is an increase or decrease in firm risk after diversification. When I divide the diversifying firms into two sub-samples based on how risk changes around diversification, I find little evidence in support of the coinsurance effect.

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Internal Capital Markets, Firm Risk, Leverage, and Corporate Diversification

1. Introduction

The extant literature suggests that there is a diversification discount[20] (see, for example, Berger and Ofek, 1995; Comment and Jarell, 1995; and Servaes, 1996). There are two main explanations for the diversification discount. Some studies attribute the diversification discount to inefficient internal capital markets in diversified firms. For example, Berger and Ofek (1995) document evidence that multi-segment firms' cross-subsidization of segments with poor growth opportunities can partially explain the lower excess value of diversified firms. The literature on internal capital markets argues that internal power struggles and rent seeking within a diversified firm can lead to investment distortions between divisions of a diversified firm, thereby resulting in a diversification discount (see, for example, Rajan et al., 2000; and Scharfstein and Stein, 2000). Rajan et al. (2000) find that greater diversity in investment opportunities leads to more inefficient investments and lower excess value for diversified firms.

An alternative explanation for the diversification discount is related to firm risk. Due to the imperfect correlation between the cash flows of different segments, diversified firms may have lower firm risk than focused firms. Decreased firm risk may cause a wealth transfer from shareholders to bondholders through what is known as the coinsurance effect.

[20] Berger and Ofek (1995) compute the excess value as the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. They estimate a regression of the excess value on firm diversification and some control variables. Their multi-segment indicator variable captures the percentage difference in average excess value between single segment firms and multi-segment firms. If the coefficient of the multi-segment indicator is negative and significant, it is called the diversification discount. If it is not significant, there is no diversification discount. They find that the lost value from diversification (or what it is termed as the diversification discount) ranges from 13% to 15% during the period 1986-1991.

Mansi and Reeb (2002) find that once the market value of bonds rather than the book value of bonds is used to compute the firm value, there is no diversification discount. An implication of their study is that diversification discount is a phenomenon of levered firms only and should be termed more precisely as shareholder value loss due to the wealth transfer to bondholders.

The previous literature always looks at these two sources of the diversification discount separately. It is quite likely, however, that the diversity in investment opportunities may be related to the firm risk of diversified firms. For example, if there is a larger diversity in investment opportunities, the cash flows of these segments are less likely to be correlated with each other, and as a result, the variance of the firm's overall cash flows may be lower. Thus, the evidence that is being construed as being consistent with power struggles and/or rent seeking of divisional managers may also be consistent with a transfer of wealth from shareholders to bondholders in a diversified firm. In this paper, I account for these two effects simultaneously in order to get a better idea of how important each is in determining the diversification discount.

I also study some interesting sub-samples of diversified firms in a further effort to separate out these two effects. First, I examine a sub-sample of all-equity firms in an attempt to isolate the effect of internal capital market inefficiency as an explanation for the lower excess value of diversified firms. In all-equity firms, firm risk will not play a role since these firms have no leverage, and thus, the question of wealth transfer from shareholders to bondholders does not arise. Therefore, if we find a negative relation between the excess value and the diversity in investment opportunities for these firms, it can be wholly attributable to investment distortions in multi-segment firms. Second, I

isolate the effect of firm risk/leverage on the diversification discount by using a sub-sample of pseudo conglomerates. Since pseudo conglomerates have segments that all operate in the same four-digit SIC code, they will have very little if any diversity in investment opportunities, thus allowing me to focus on firm risk/leverage as the explanation for the discount.

The results of my analysis contribute to the literature in three important ways. First, it is the first study that looks into these two major sources of the diversification discount simultaneously and, therefore, provides a clearer picture of how cross-subsidization across divisions and the transfer of wealth from shareholders to bondholders each contributes to the diversification discount. I document evidence that diversity in investment opportunities is always strongly related to the excess value, while the coinsurance effect does not significantly affect the excess value in most cases.

Second, I argue that the level of diversification is related to both diversity in investment opportunities and firm risk. I, therefore, examine the relationship between the level of diversification and excess value after controlling for diversity and risk. I find that the level of diversification continues to negatively affect firm value. This means that diversification destroys value through more ways other than just its correlation with firm risk and diversity in investment opportunities.

Third, I do not just simply assume that there is a decrease in firm risk after diversification. Instead, I argue that it is possible that firm risk increases after diversification and, in such cases, higher leverage may cause a transfer of wealth from bondholders to shareholders. Thus, I divide firms that diversify from a single segment to multiple segments into two sub-samples based on whether firm risk increases or decreases

around the diversification event. I then examine the relationship between the change in excess value and leverage for these two sub-samples separately. These tests enlighten us on how the interaction between the change in firm risk around diversification and the leverage of the firm affect firm value. The results from these tests also provide little support for the coinsurance effect.

The remainder of this paper is organized as follows. Section 2 gives an overview of related literature and the development of hypotheses. Section 3 describes the data and the sample selection process. Section 4 explains the methodology used in the paper. Section 5 provides and discusses descriptive statistics on the sample firms. Section 6 presents the results related to the factors that impact firms' decision to diversify or remain focused, use all-equity financing or leverage in the capital structure, and be a pseudo-conglomerate or a real conglomerate. The main results of empirical analysis are contained in Section 7. Section 8 summarizes and concludes the paper.

2. Prior Literature and Development of Hypotheses

2.1. Two Main Explanations of Diversification Discount

The literature on internal capital markets argues that the power struggles and the rent seeking within a diversified firm are related to the diversification discount. For example, in the model of Rajan et al. (2000), it is the diversity of investment opportunities and resources among the divisions of the firm that drives inefficient allocations or cross-subsidization. The more diverse in investment opportunities a firm's divisions are, the larger are the distortions in the allocation of resources generated by internal power struggles. They report empirical evidence that the diversity in investment opportunities leads to inefficient investment and low excess value for diversified firms. Scharfstein and

Stein (2000) argue that misallocation of investments across divisions can arise from rent-seeking and bargaining between divisional managers and corporate headquarters. One of their main results is that this large cross-subsidization is more likely to happen for firms with bigger divergence in the strength of the divisions and lower CEO equity ownership.

The lower firm risk of diversified firms can also be related to the diversification discount. The call option pricing model, such as the one proposed by Black and Scholes (1973), suggests that the adoption of projects which reduce the variance of the firms' income distribution (such as diversification) may induce a wealth transfer from shareholders to bondholders, thus adversely affecting the value of the shareholders.[21] This directly benefits bondholders by reducing their risk. Shareholders will be worse off because they are the holders of a call option on the firm's assets, and the value of this call option decreases when cash flow variance is reduced.

Diversified firms have lower firm risk due to the imperfect correlation of cash flow pattern of their different segments. The lower firm risk combined with leverage causes a wealth transfer from shareholders to bondholders. Mansi and Reeb (2002) document evidence that the lower excess value of diversified firms is related to firm leverage. When they use the market value of both debt and equity to compute firm value, diversification is insignificantly related to firm value, and the diversification discount is insignificantly different from zero. However, they focus on the relationship between the leverage and firm value and find that leverage (defined as long-term debt/total assets) plays an important role in explaining the diversification discount. They just assume that this transfer of wealth from shareholders to bondholders is due to lower firm risk. Although they mention that

[21] If a merger of the two firms entails no costs, it will benefit both firms because the resulting cash flow will be less volatile (Stulz, 1990).

firm risk can explain part of the diversification discount in a footnote (footnote 9 in their paper), they do not examine how diversification affects firm risk and how firm risk affects firm value, that is, they examine the relationship of diversification discount and leverage without controlling for firm risk. I adopt a different method. I examine the relationship between diversification discount and firm risk after controlling for firm leverage. I argue that if other factors (e.g., firm size, profitability, capital expenditure and leverage) are constant, then the diversified firms with lower risk will have lower revenue based excess value and larger diversification discount for any given level of leverage.

2.2. Possible Relationship between Diversity of Investment Opportunities and Firm Risk

Diversity of investment opportunities and firm risk can be related to each other through the pair-wise cash flow covariance between segments as well as the cash flow variance of each segment. If investment opportunities are related to industry (different industries may have different investment opportunities), the diversity in investment opportunities may be related to the connection between different industries represented by the segments of diversified firms. For example, if two segments produce complementary products, the investment opportunities of these two segments should be similar. At the same time, as the demand for these related products changes, the cash flows of these two segments change in the same direction. If other factors are constant, then the variance of this firm's cash flow should be higher than that of a firm which has a larger disparity in investment opportunities. In contrast, if there is high degree of diversity in the segments' investment opportunities, the demand for the products of the different segments may be quite different. It follows that the covariance of the cash flows of these segments will be lower, and the firm will have a lower variance of overall cash flow.

Diversity and firm risk can also be related through the cash flow variance of each segment. Suppose one segment of the firm is very large and has a high cash flow variance, while the other segment of the firm is small and has low cash flow variance. Both diversity measures[22] will be big for this firm. At the same time, the overall risk of the firm will also be high. In this case, diversity and firm risk are positively correlated with each other. The correlation of diversity and firm risk is jointly determined by both the cash flow covariance of the segments and the cash flow variance of each segment of diversified firms.

Burch and Nanda (2003) document evidence that the diversity in investment opportunities is significantly related to value improvements of spin-offs even after the inclusion of investment policy measures. This implies that diversity affects firm value through more than the change in investment policy. They argue that their results are in line with the model of Meyer, Milgrom, and Roberts (1992). In this model, the lobbying efforts of divisional managers can cause value losses even though the efforts do not lead to distorted investment policy. An inference from their results is that the diversity in investment opportunities is related to firm risk, and through the relationship of firm risk and equity value, diversity affects value.

The connection between different industries represented by the segments may affect the cash flow variance (and the firm risk) as well as the cash flow level of different segments of diversified firms. The extant literature on internal capital market has examined

[22] The diversity measure proposed by Rajan et al. (2000) is the standard deviation of asset-weighted Q across segments divided by the simple average of the segment Qs, where industry Q values are used to proxy for segment Qs. The diversity measure proposed by Scharfstein and Stein (2000) and used by Burch and Nanda (2003) measures diversity in raw divisional Qs and is not scaled by the simple average of segment Qs. For example, consider a firm with two divisions with asset weights of 0.40 and 0.60, and Q-values of 1.20 and 0.8, respectively. Here, RSZ will show a diversity value of zero since WQ =0.48 for both divisions, whereas BN will show a positive diversity value to reflect the difference in the raw Q-values. In contrast, if both divisions have the same Q-value but different sizes, the BN diversity will equal to zero but RSZ will be positive. I use both measures in this study, as it is hard to tell which measure is better than the other.

how the diversity in investment opportunities, through power struggle and rent seeking, affects the cash flow level of different segments. In this paper, I will examine how the diversity in investment opportunities affects the variance of the firm's overall cash flow, and how, through its effect on firm risk, the diversity in investment opportunity affects the excess value of diversified firms.

I conjecture that by including firm risk, the explanatory power of diversity of investment opportunities of different segments (which proxy for the power struggle or rent seeking of division managers) will be affected. By doing so, we can get a more accurate picture of how much power struggles and rent seeking behavior in diversified firms will affect firm value.

2.3. The Level of Diversification and Firm Risk

Earlier studies have shown that an increase in the number of segments results in a higher diversification discount; and a decrease in the number of segments increase firm value, and the increase in value is highest if the divested segment is unrelated to the main business of the firm (Berger and Ofek, 1995; Lang and Stulz, 1994; Comment and Jarrell, 1995; John and Ofek, 1995; Berger and Ofek, 1999; Krishnawami and Subramaniam, 1999). For example, Comment and Jarrell (1995) find that a reduction of one in the number of SIC codes assigned by Compustat yields a 3% increase in annual stock returns, and a reduction of one in the number of segments yields a 5% increase in annual stock returns.

I consider diversity in investment opportunities and firm risk as links between the number of segments and shareholder value and examine whether these two factors are the reason that the number of segments affects firm value. I assume that the cash flows of

different segments are not perfectly correlated. In this case, if we put the eggs in more baskets, the risk of losing all the eggs decreases. It follows that the increase in the number of segments will decrease the volatility of the firm's cash flows, thereby decreasing shareholders' value.

Comment and Jarrell (1995) find that sigma (measured as the standard deviation of the residuals from a regression using a single-factor market model) increases with the level of focus (measured as the revenue-based Herfindahl index), but they do not provide evidence of a reliable relation between equity beta (computed using a single-factor market model based on a year's worth of weekly returns) and focus. I use the number of segments as a proxy for diversification level and examine the relationship between the level of firm diversification and firm risk (volatility of firm's cash flow). I also test the relationship between the level of firm diversification and excess value after controlling for firm risk. If, after controlling for firm risk, the negative relationship between the level of diversification and excess value disappears, it follows that diversification does not destroy firm value. All that happens then is that diversification causes a wealth transfer from shareholders to bondholders. If, after controlling for firm risk, the relationship between the level of diversification and excess value becomes positive, it may imply that diversification creates value for the firm as a whole, even though it destroys shareholders' value.

The level of diversification can also be related to the diversity in investment opportunities. For example, as the number of segments decreases in spin-off, so does the diversity in investment opportunities (see, for example, Burch and Nanda, 2003). It seems that the more diversified a firm is, the higher diversity it has in investment opportunities. How diversity and the level of diversification are related to each other cross-sectionally is

still an empirical issue. In this paper, I examine how the number of segments affects firm value after firm risk and diversity are controlled for.

2.4. Firm Risk, Leverage, and Diversification Discount

Some firms may experience a decrease in firm risk after they diversify. However, if the new segment is much riskier than the existing one, we may actually observe an increase in firm risk after diversification[23]. In this case, there should be a wealth transfer from bondholders to shareholders. Thus, it is necessary that we differentiate between these two cases and examine the relationship between leverage and firm value for them separately. If the firm risk is lower after diversification, we expect a wealth transfer from shareholders to bondholders. For these firms, the revenue-based excess value will decrease with firm leverage. If the firm risk is higher after diversification, we expect a wealth transfer from bondholders to shareholders for firms. This wealth transfer will increase with firm leverage, and thus, the revenue-based excess value will increase with firm leverage.

3. Variables and Sample Selection

3.1. Excess Value

I follow Berger and Ofek (1995) to compute the excess value. Excess value is computed as the logarithm of the ratio of the firm's actual value to its imputed value. The actual value is the market value of equity plus the book value of debt, and the imputed value is the sum of the imputed stand-alone values for each business segment. To compute the imputed value of each business segment, I multiply the segment sales by the median

[23] Erhemjamts (2005) find that on average, firm risk does not decrease after the diversification event.

market-to-sales ratio of the single-segment firms that are in the same industry of that business segment.

I get the data from the Compustat Industry Segment database for years 1984 to 2004. I follow the previous studies such as Berger and Ofek (1995) and exclude firm-year observations when firms have segments in the financial services industry (SIC 6000-6999), or when firms have sales less than $20 million, or when firms do not report the value for the total capital, or when the sum of segment sales of the firm is not within one percent of the reported sales of the firm. In addition, I also exclude firm years when firms do not report four-digit SICs for all their segments. The final sample consists of a total of 66,424 firm-year observations.

3.2. Diversity in Investment Opportunities

I use two measures of the diversity in investment opportunities. The first one is related to the proxy proposed by Rajan, Servaes, and Zingales (2000) (hereafter RSZ). RSZ used the standard deviation of asset weighted segment Q, scaled by the equally weighted segment Q to proxy for the diversity in investment opportunities:

$$\text{Diversity}=\frac{\sqrt{\sum_{j=1}^{n}\frac{(w_j q_j \quad \overline{wq})^2}{n-1}}}{\frac{\sum_{j=1}^{n} q_j}{n}}$$

where w_i is the asset weight of segment i, q is the Tobin's q for the industry that the segment is in, and n is the number of segments the firm has. To make my two measures of diversity comparable, I use the numerator of the above equation, that is, the standard deviation of the asset weighted segment Q, as my first diversity measure.

Following Burch and Nanda (2003), I compute another measure of diversity in investment opportunities, which is the asset-weighted standard deviation of equally weighted segment Qs:

$$\text{Diversity}=\sqrt{\sum_{j=1}^{n}\frac{w_j(q_j-\bar{q})^2}{n-1}}$$

where w_i, q and n are the same as the first diversity measure.

For both diversity measures, I use the median market to book value of assets of all the single segment firms in the industry which have the same SIC code as the segment to proxy for the segment Q. Industry medians are calculated based on the narrowest SIC grouping that include at least five single segment firms. I follow Campa and Kedia (2002) to compute the market value of the firm, which is the sum of the market value of equity, short-term and long-term debt, and preferred stock. Following Berger and Ofek (1995), I delete all firm years when the sum of the segment assets of the firm is not within seventy-five percent of reported assets of the firm and when firms do not have all the data available to compute the market-to-book ratio.

3.3 Firm Risk

Four proxies for firm risk are employed in this paper. The first proxy is the standard deviation of ROA (which is operating income before depreciation divided by total assets). Specifically, ROA is measured as Compustat data item 21 divided by Compustat data item 44. The second measure of risk is the standard deviation of operating cash flows.[24] I compute these two risk measures for the single segment firms and the multiple

[24] The operating cash flow is the operating income before depreciation and taxes plus decreases in accounts receivable, plus decreases in inventory, plus increases in accounts payable, plus decreases in other current

segment firms separately. For single segment firms (multiple segment firms), I require the firm to stay focused (diversified) for the current year and the next two years. Additionally, I require these firms to have data available to compute the operating cash flows for at least ten quarters in these three years. The standard deviation of monthly return is the third measure of firm risk. The daily market return data from the Center for Research in Securities Prices (CRSP) daily returns master tape are used to compute the monthly returns. These firms need to have daily data available for at least 19 trading days each month to get the monthly return and at least 11 months data to find the standard deviation of monthly return. Finally, I collect the weekly return data from CRSP and estimate the single-factor market model. The standard deviation of the residuals from this regression is used as the fourth measure of firm risk.

3.4 Other Variables

To investigate the relation between corporate diversification and excess value, I use the same regression specified in Berger and Ofek (1995), which is:

$$EXVAL = \beta_0 + \beta_1(NSEG) + \beta_2(LSIZE) + \beta_3(EBIT/SALES) + \beta_4(CAPX/SALES) + \varepsilon \quad (1)$$

where *EXVAL* is the excess value based on the Berger and Ofek (1995) measure; *NSEG* is the number of segments a firm has; *LSIZE* is the natural logarithm of total assets; *EBIT/SALES* is the EBIT-to-sales ratio; and *CAPX/SALES* represents the capital expenditures-to-sales ratio. As Mansi and Reeb (2002) show that leverage plays an important role in explaining the excess value and diversification discount, I also include

assets, plus increases in other current liabilities. Specifically, it is measured as Compustat data item 21 - (data item 37 - Lag (data item 37)) - (data item 38 – Lag (data item 38)) - (data item 39 – Lag (data item 39)) + (data item 46 - Lag (data item 46)) + (data item 48 - Lag (data item 48)). Kini et al. (2004) use this method to compute operating cash flow.

leverage into the above regression. I use the ratio of interest bearing debt (short-term and long-term debt) to total assets to measure leverage.

4. Methodology

4.1 OLS Regression and Sub-samples

4.1.1. OLS Regression

To examine the relative importance of internal capital market inefficiency and firm risk/leverage, I add variables such as the diversity of investment opportunities, firm risk and the interactive term of firm risk and leverage to the equation (1).

I estimate the following regression:

$$\begin{aligned} EXVAL &= \beta_0 + \beta_1(NSEG) + \beta_2(LSIZE) + \beta_3(EBIT/SALES) + \beta_4(CAPX/SALES) \\ &\quad + \beta_5(LEVER) + \beta_6(DIVERSITY) + \beta_7(RISK) + \beta_8(RISK*LEVER) + \varepsilon \end{aligned} \quad (2)$$

where *DIVERSITY* is one of my two measures of diversity in investment opportunities, *RISK* represents one of my proxies for firm risk, and *RISK*LEVER* is an interactive variable of risk and leverage. All other variables are defined as before.

Mansi and Reeb (2002) use leverage to proxy for the coinsurance effect, but leverage can affect firm value through ways other than the coinsurance effect[25], and we can not attribute all of its effect on firm value to the coinsurance effect. As it is leverage combined with firm risk that causes the wealth transfer between the bondholders and shareholders, I use the interactive term of leverage and firm risk to capture the coinsurance

[25] If we treat higher leverage as an effective bonding device for management, higher leverage may lower agency costs and improve performance. Li and Li (1996) find that *keiretsu* (enterprise group, a prominent industrial structure in Japan) do have higher leverage and better performance than non-group firms. In contrast, according to their theory, the lower performance of the conglomerate merger wave in U.S. in 1960s is due to these firms' lower leverage. Another example that leverage can affect firm value through ways other than the coinsurance effect is that higher leverage can benefit a firm by increasing interest tax shields but also have a detrimental impact of firm value through increased present value of expected bankruptcy costs.

effect. As my main concern is how internal capital market inefficiency and coinsurance effect each contribute to the lower excess value of diversified firms, I examine their coefficients and significance to see if one effect dominates the other. If the coefficient of diversity becomes insignificant after I include risk, it means that the diversity of investment opportunities does not affect total firm value but only affects shareholders value through its correlation with firm risk. Since firm risk only causes a wealth transfer between the bondholders and shareholders, it does not affect the firm value as a whole. However, if the interactive term of firm leverage and risk is insignificant but the diversity measures are still highly significant, it follows that the internal capital market inefficiency dominates the coinsurance effect in explaining the excess value of diversified firms.

I also pay attention to the coefficient of the number of segments (*NSEG)* after I include the diversity and risk measures. If it is still negatively significant after diversity and risk are included, it follows that the level of diversification affects firm value through ways other than its correlation with internal capital market inefficiency and firm risk. If the coefficient of *NSEG* becomes positive after the inclusion of diversity and risk measures, it implies that diversification creates value after accounting for the coinsurance effect and internal capital market inefficiency.

I also compute the correlation matrix of the number of segments and different measures of diversity and risk. This test tells us how much of the variation of the number of segments is associated with diversity in investment opportunities and firm risk.

4.1.2. Sub-samples: All-equity Firms and Pseudo Conglomerates

I use all-equity conglomerate firms to isolate the effect of diversity in investment opportunities on the excess value. I define all-equity firms as firms which have interest

bearing debt (long-term debt and debt in current liabilities) less than one percent of total assets. For firms with no leverage, the shareholders' equity cannot be represented by a call option on the firm's assets; therefore, there is no coinsurance effect. Put it in another way, as there is no bondholder for all-equity firms, the wealth transfer between shareholders and bondholders cannot arise. Thus, if there is any discount for all-equity firms, the discount should then be mainly attributable to inefficient internal capital markets.

I also use the pseudo conglomerate firms to isolate the impact of the coinsurance effect on excess value. Pseudo-conglomerates are diversified firms that have all divisions operate in the same finely defined industry, i.e., all segments share the same four-digit SIC code. As all segments of pseudo-conglomerates share the same four-digit SIC code, they have the same growth opportunities.[26] Since there is no diversity in investment opportunities for pseudo-conglomerate firms, and because it is the diversity in investment opportunities that causes internal capital market inefficiency, the discount for pseudo-conglomerates cannot be attributable to inefficient internal capital markets. It follows that if there is any diversification discount for pseudo conglomerates, it will be mainly caused by the lower firm risk in leveraged conglomerates.

4.1.3. Sub-samples: Firm Risk Increases or Decreases around Diversification

According to the coinsurance effect theory, leverage can have different effects on shareholders' value based on whether firm risk increases or decreases. When there is a decrease in firm risk, there will be a wealth transfer from shareholders to bondholders, so excess value decreases. However, when firm risk increases, wealth transfers from bondholders to shareholders, thus increasing the excess value. To further test the

[26] Segment q's are proxied by industry median market-to-book values, which are calculated at the four-digit SIC level whenever there are at least five single segment firms with available data, and at the three-digit SIC level or two-digit level as needed.

coinsurance effect, I divide my sample based on whether firm risk increases or decreases around diversification. I test the relationship between the change in excess value and the change in leverage for these two sub-groups. I estimate the following regression for these two sub-groups:

$$\Delta EXVAL = \beta_0 + \beta_1(LSIZE) + \beta_2(EBIT / SALES) + \beta_3(CAPX / SALES) + \beta_4(LEVER) + \varepsilon \quad (3)$$

All the variables in the above specified regression are as defined earlier. From this test, we learn how leverage affects excess value differently under situations where firm risk either increases or decreases after the addition of segment(s).

4.2 Selection Bias

Firms choose to diversify. Some latent factors that affect the firms' propensity to diversify can also affect the firm value. It is necessary to control for the selection bias before we can draw a reasonable conclusion on how certain factors affect the excess value of diversified firms.

4.2.1. Fixed Firm Effect Estimation

Fixed firm effects allow us to control for unobserved heterogeneity, if we assume all these firm characteristics are fairly stable over time. As my dataset is a panel dataset, I use the fixed firm effect estimation as one way to control for the selection bias, assuming that the unobserved heterogeneity that causes the correlation between the error terms is constant over time. Rajan, Servaes, and Zingales (2000), Campa and Kedia (2002) and Villalonga (2004) all use this methodology to control for the selection bias in their study.

4.2.2. Heckman's Two Stage Model

Heckman's model deals with the bias that relates to the selection on unobservables. To identify this effect, there should be at least one variable that affects the selection equation but is not included in the value equation. Heckman's model assumes joint normality of the error terms of the selection equation and the value equation with a non-zero correlation. For example, this correlation is negative as hypothesized for diversified firms, leading the estimated discount, using OLS, to be biased downward. The first stage of Heckman's model estimates a probit model (the selection equation) and gets the inverse mills ratio, and then in the second stage of the model, the inverse mills ratio is included in the value equation to correct for the selection bias.

Like Campa and Kedia (2002) and Villalonga (2004), I use macroeconomic, industry, and firm level characteristics to predict firms' propensity to diversify. At the macroeconomic level, I use the number and the annual value of merger and acquisition announcements (*MNUM* and *MVOL*) to capture the existence of merger waves and the real growth rate of gross domestic product (*GDP*) and the number of months in the year that the economy was in a recession (*CONTRACTION*) to capture the macroeconomic conditions and business cycles. At the industry level, I use the fraction of all firms in the industry which are multi-segment firms (*PNDIV*), the fraction of sales in the industry accounted for by multi-segment firms (*PSDIV*), and industry q (*INDQ*) to capture the overall attractiveness of a given industry to conglomerates. At the firm level, the variables that I use are firm size (*LSIZE*), profitability (*EBIT/SALES*), investment (*CAPX/SALES*), growth opportunities (*R&D/TA*), firm age (*LAGE*), and free cash flow (*DIVIDEND*). In addition, I also create three dummy variables: *MAJOREX* (if a firm is listed in a major exchange, i.e.,

NYSE, AMEX, and NASDAQ), *S&P* (if a firm belongs to the S&P industrial index or the transportation index), and *FOREIGN* (if a firm is incorporated abroad). *MAJOREX* and *S&P* control for information asymmetry and liquidity, respectively. A foreign firm may list in the U.S. as a part of corporate restructuring strategy, thus is more likely to engage in diversification activities. The computation of these variables is described in Campa and Kedia (2002) and Villalonga (2004).

Similarly, I use macroeconomic, industry, and firm level characteristics to predict firms' propensity to be an all-equity firm or a pseudo-conglomerate. Sanzhar (2004) find that pseudo-conglomerates concentrate in certain industries, such as computer programming and communication equipment. This means that industry factors are important to determine the firms' propensity to be pseudo-conglomerates. Similar to pseudo-conglomerates, all-equity firms also tend to be in the technology related industries.

I use the same variables at the macroeconomic level and firm level to predict a firms' propensity to be an all-equity firm and a pseudo-conglomerate. Macroeconomic factors such as the GDP growth rate and the business cycle can have a more dramatic effect on technology related industry, thus influencing the probability of firms to be all-equity firms or pseudo-conglomerates. For example, it may be easier for these technology related firms to access equity capital during economic boom. Firm level characteristics can also be related to a firm's probability to be an all-equity firm or a pseudo-conglomerate. Firms with good growth prospects usually are smaller, younger, less likely to pay dividends and spend more on capital expenditure and research and development. These firms are more likely to be in the technology related industries and be all-equity firms or pseudo-

conglomerates. Firms listed on a major exchange have better access to equity capital and are more likely to be all-equity firms.

At the industry level, I use the fraction of all firms in the industry which are all-equity firms (pseudo-conglomerates) and the fraction of sales in the industry accounted for by all-equity firms (pseudo-conglomerates) to capture the overall attractiveness of a given industry to all-equity firms (pseudo-conglomerates). I also include industry q as an industry level instrument in the selection equation for pseudo-conglomerates and all-equity firms.

I obtain the data on merger activities from the Securities Data Corporation (SDC), GDP growth rate and business cycles from National Bureau of Economic Research (NBER), firm age from the Center for Research in Securities Prices (CRSP), and other variables from Compustat.

For the full sample, I use both single segment firms and multi-segment firms in the selection equation and only diversified firms in the value equation. For all-equity firms or pseudo-conglomerates, I use all diversified firms in the selection equation and all-equity diversified firms or pseudo-conglomerates in the value equation to control for the selection bias.

5. Descriptive Statistics

Table 1 provides the distribution of excess value by year for multi-segment firms and single segment firms in the sample. The sample consists of 66,424 observations, 46,561 of which are from single segment firms and 19,863 from multi-segment firms. For single segment firms, the median excess value for each year and for all the firm years are all close to zero. This is consistent with Berger and Ofek (1995) and Campa and Kedia (2002). The mean of the excess value of single segment firms is -0.006, which is

comparable with the one (0.001) reported by Berger and Ofek (1995). The mean (median) excess value for multiple segment firms is -0.102 (-0.109), while Berger and Ofek (1995) report mean (median) excess value of -0.097 (-0.106). The median excess value of multiple segment firms is negative in every year. It ranges from a low of -0.192 in year 1985 and 2003 to a high of -0.054 in 1989. Due to the changes of rule on segment reporting (SFAS No.131), there is an increase in the number of multiple segment firms from 1998.[27]

The distribution of excess value by year for the all-equity firms is presented in Table 2. There are 8,735 firm years in my sample, 7,363 of these observations belong to single segment firms and the remaining 1,372 belong to multi-segment firms. The mean (median) excess value for the all-equity diversified firms is -0.063 (-0.078), which is higher than that of all diversified firms. The mean (median) excess value of the all-equity single segment firms is 0.122 (0.104), which is also higher than that of all single segment firms reported in Table 1. I also compute the excess value of all-equity firms based on Mansi and Reeb's definition (long-term debt to total assets ratio is less than one percent). The mean (median) excess value of all-equity diversified firms based on their definition is -0.121 (-0.132), which is even lower than what is reported for all diversified firms in Table 1. The mean (median) excess value of the all-equity single segment firms is 0.055 (0.027) for their definition of all-equity firms.

[27] In 1997, the Securities and Exchange Committee (SEC) adopted the Statement of Financial Accounting Standards 131 (SFAS 131) to replace the old segment-reporting rule SFAS 14. SFAS 14 required companies to report a segment if more than 10% of the firm's assets, sales or profit could be attributed to that segment. SFAS 131 requires companies to report segments consistent with the way in which management organizes the business internally. Therefore, the segment reporting is more consistent with the organizational structure of the firm under SFAS 131. After adoption of the new rule, many single segment firms started reporting their financials as multi-segment firms, while there were very few multi-segment firms that began reporting as single segment firms.

The distribution of excess value by year for the pseudo-conglomerate firms is provided in Table 3. There are 2,472 pseudo-conglomerate firm years in the sample. I find the excess value of the pseudo-conglomerate firms is negative for most of the years. There are big time series variations of the excess value in the pseudo-conglomerate firms, with a premium of 18.8% in 1988 and a discount of -22.7% in 1992. It is noteworthy that more than three fourth of these firm-year observations belong to the years after 1998. The mean (median) excess value for pseudo-conglomerate firms is -0.103 (-0.100), whereas the mean (median) excess value is -0.102 (-0.111) for the real conglomerate firms. For real conglomerate firms, the excess value is negative for every year.

Table 4 displays descriptive statistics on the excess value, number of segments, total assets (*ASSETS*), sales, income to sales ratio (*EBIT/SALES*), net profit margin (*NPM*), capital expenditure to sales ratio (*CAPX/SALES*), capital expenditure to total assets ratio (*CAPX/TA*), firm leverage (*LEVER*), long-term leverage (*LTDLEVER*) and R&D to sales ratio (*R&D/SALES*) for multiple segment firms and single segment firms. Consistent with the previous study (e.g., Berger and Ofek, 1995), I find that the diversified firms have significantly lower excess value, larger size, larger profitability ratios, lower capital expenditure intensity, higher leverage ratios, and lower R&D intensity than the single segment firms. Consistent with Berger and Ofek (1995), the median multiple segment firms is about three times the size of the median single segment firms both in terms of sales and assets. Both the mean and median leverage ratio of multiple segment firms is higher than that of the single segment firms, consistent with the findings of other research that diversified firms borrow more. The mean R&D to sales ratio of diversified firms is less than half that of focused firms.

Similar descriptive statistics are presented for all equity firms in Table 5. I find that the all-equity diversified firms have significantly lower excess value, larger size, and lower R&D intensity than the all-equity focused firms. The median all-equity diversified firms are about one and a half times the size of the median all-equity focused firms in terms of sales and assets. The median R&D-to-sales ratio of all-equity diversified firms is only one sixth that of the all-equity focused firms.

Table 6 displays similar descriptive statistics for pseudo-conglomerate firms and real conglomerate firms. Interestingly, although the median (mean) excess value of pseudo-conglomerate firms is higher (lower) than that of the real conglomerates, the difference is not statistically significant. I find that the pseudo-conglomerate firms have significantly fewer segments, smaller size, lower profitability ratios and leverage ratios, and higher R&D intensity than real conglomerate firms. The median pseudo-conglomerate firm has two segments, whereas the median real conglomerate firm has three segments. The median real conglomerate firm is about 1.5 times the size of the pseudo-conglomerate firm. The mean R&D to sales ratio of pseudo-conglomerate firms is more than twice that of real conglomerate firms.

Table 7 describes the diversity in investment opportunities. Both the mean and median values using the RSZ measure are quite stable over time, with the mean (median) values across years ranging from 0.300 to 0.321 (0.262 to 0.283). This result is consistent with previous studies such as Rajan et al. (2000). In their study, the mean (median) of this diversity measure is 0.295 (0.251). The value in the diversity in investment opportunities using the Burch and Nanda (2003) method is also very stable, with the mean (median) value across years ranging from 0.086 to 0.231 (0.043 to 0.107). This diversity measure

reported by Burch and Nanda (2003) has a mean (median) of 0.149 (0.106) before spinoff and a mean (median) of 0.135 (0.096) after spinoff.

The summary statistics of the four firm risk measures are reported in Table 8. There are 8,329 firm years that have data available to compute the standard deviation of operating cash flow (*STD_OCF*) and standard deviation of return on assets (*STD_ROA*). The mean of *STD_OCF* (*STD_ROA*) is 0.038 (0.014) and the median is 0.029 (0.010) for *STD_OCF* (*STD_ROA*). Due to the less restrictive requirements to compute the two market-based risk measures, the number of *STD_MONRET* (*RMSE*) is about the twice the number of *STD_OCF* (*STD_ROA*). *STD_MONRET* has a mean (median) of 0.125 (0.104), while RMSE has a mean (median) of 0.063 (0.052).

I argue in this paper that because the number of segment, diversity, and firm risk measures are correlated with each other, it is necessary to examine the coinsurance effect and internal capital market inefficiency simultaneously. Table 9 presents the correlation matrix of the number of segments, the two diversity measures, and four risk measures. As can be seen from the table, the four risk measures are highly correlated with each other. The two accounting return based risk measures (*STD_ROA* and *STD_OCF*) have a correlation of 0.43 with each other and the two market return based risk measures (*STD_MONRET* and *RMSE*) have a correlation of 0.79 with each other. The range in the correlation coefficients between the accounting and market-based measures of risk is from 0.21 to 0.32. However, the two diversity measures (*RSZ* and *BN*) are only 5.7% correlated. The risk measures are also correlated with the diversity measures, with *STD_ROA* (*STD_MONRET*) correlated with *RSZ* by 5.3% (7.1%) and with *BN* by 3.6% (4.2%). As expected, the number of segments is negatively correlated with the four risk measures, with

the correlation ranging from -8.1% (with *STD_OCF*) to -12.1% (with *RMSE*). The number of segments is positively related with the diversity measures, the correlation with *RSZ* is -0.39, and the correlation with *BN* is only -0.053. All these correlations are significant at the one percent level.

6. Selection Models

Firms choose to diversify or remain focused, use all-equity financing or some leverage in their capital structure, operate as a pseudo-conglomerate or a real conglomerate, etc. We attempt to model these choices in this section. These choice models also serve a the first-stage in our later analysis of the determinants of excess value using Heckman's two-stage methodology to control for self-selection.

6.1. The Full Sample of Diversified Firms

In this sub-section, we describe the results obtained from modeling a firm's decision to diversify or remain focused by estimating a probit regression. The results of this probit model are reported in column one of Table 10. Firm level factors play an important role in firms' decision to diversify. Firms with larger size (*LSIZE*), lower profitability (*EBIT/SALES*) and less investment in current operations (*CAPX/SALES*) are more likely to diversify. Firms that are older (*LAGE*) and have fewer investment opportunities (*R&D/TA*) are also more likely to diversify. At the industry level, the coefficient of the two variables that capture the attractiveness of an industry to diversify is positive, with the fraction of firms in the industry that are diversified (*PNDIV*) being highly significant. This is consistent with the results found by Campa and Kedia (2002). The industry q (*INDQ*) is positively and significantly related to a firm's propensity to diversify; this is counter-intuitive, but Villalonga (2004) also finds the coefficient of industry q to be positive. My

results regarding the GDP growth rate and business cycle are positive and consistent with the two studies mentioned above. My results regarding other variables (*MVOL*, *NMERGER*, *S&P*, *MAJOREX*, and *FOREIGN*) are all consistent with Villalonga (2004). *MVOL* is positive and insignificant and *NMERGER* is negative and significant, but the coefficients of both variables are close to zero. Finally, the coefficients associated with *S&P*, *MAJOREX*, and *FOREIGN* are all insignificant.

6.2. The Sub Sample of All-equity Firms

The results from a probit regression estimation of modeling a firm's choice of being an all-equity firm are contained in the second column of Table 10. Firm level factors are important in a firm's decision to be an all-equity firm. Firms with smaller size (*LSIZE*), higher profitability (*EBIT/SALES*), more investment in current operations (*CAPX/SALES*), and have more investment opportunities (*R&D/TA*) are more likely to be an all-equity firm. At the industry level, the coefficient of *PNALEQ* that captures the attractiveness of an industry to all-equity firms is positive and highly significant. Industry q (*INDQ*) is negatively related to firm's propensity to be an all-equity firm, but is not significant. *MVOL* and *NMERGER* are insignificant, and the coefficients of these two variables are close to zero. The coefficient of S&P is negative and significant. The coefficient of *MAJOREX* is positive and significant as expected. Firm age (*LAGE*) and whether the firm is incorporated in a foreign country (*FOREIGN)* are not significant.

6.3. The Sub Sample of Pseudo Conglomerates

The results of the probability that a firm is a pseudo-conglomerate are displayed in column three of Table 10. A firm with smaller size (*LSIZE*) and better investment

opportunities (*R&D/TA*) is more likely to be a pseudo-conglomerate. At the industry level, the coefficient of *PNPSEU* (the fraction of firms in the industry that are pseudo-conglomerates) that capture the attractiveness of an industry to pseudo-conglomerates is positive and highly significant. Industry q (*INDQ*) is negatively related to a firm's propensity to be a pseudo-conglomerate, but is not significant. Both *MVOL* and *NMERGER* are insignificant, and their coefficients are close to zero. The coefficient of *LAGE* is negatively significant, which means younger firms are more likely to be pseudo-conglomerates. All other variables are not significant.

7. Main Results

7.1 The Full Sample of Diversified Firms

7.1.1. OLS Regression

Table 11 displays the OLS regression results for the full sample of diversified firms. Column 1 gives results without the inclusion of diversity measures and risk measures. Column 2 includes diversity measures and column 3 and column 5 report results after adding *STD_ROA* and *STD_MONRET* as risk measures. Column 4 and column 6 include the interactive term of these two risk measures and leverage to capture the coinsurance effect.

The number of segments is always negatively and significantly associated with the excess value, even after the inclusion of diversity measures and risk measures, implying that the level of diversification can affect firm value through ways other than inefficient internal capital market and the coinsurance effect. Leverage is positively related to the excess value, which is consistent with higher present value of interest tax shields, signaling

effect of debt, and disciplining effect of debt. However, the t-statistics of the leverage decrease noticeably after the interactive term of leverage with firm risk is included. In fact, leverage becomes insignificant after its interactive term with *STD_MONRET* is included. It seems that an important way that leverage affects firm value is through the coinsurance effect. Both diversity measures are always negatively and significantly related to the excess value, and the significance does not change much after risk measures are included. Firm risk is positively related to the excess value. This result may be attributable to the fact that high risk firms are more likely to be high growth firms. However, the significance of both risk measures decrease after the inclusion of their interactive term with leverage. After the interactive term is included, both *STD_ROA* and its interactive term with leverage are insignificant. Similar to leverage, firm risk affects firm value mainly through the coinsurance effect. Relative to the coinsurance effect, diversity has a much stronger effect on firm value.

7.1.2. Fixed Effect Estimation

I use the fixed firm and year effects to control for the unobservable firm and time characteristics that may affect a firm's decision to diversify (or become an all-equity firm or a pseudo-conglomerate). Table 12 shows that the results on the number of segments, leverage, and diversity measures are practically identical to that of the OLS regression. However, firm risk seems to be negatively related to excess value, but this relationship is not significant. The interactive term of risk and leverage is not significant if *STD_ROA* is used as a risk measure, and it is at most significant at the 5% level if *STD_MONRET* is used as the risk measure.

7.1.3. Heckman's Model

The results of the second stage of the Heckman's model are shown in Table 13. Both measures of diversity in investment opportunity are negatively and significantly related to firm value. The number of segments is also negatively and significantly related to the excess value. Leverage is positively related to the excess value, but it becomes insignificant after the interactive term of the market-based risk measure (i.e., *STD_MONRET*) and leverage is included. This is consistent with the results from OLS and fixed effect estimation that leverage affects firm value mainly through coinsurance effect. The interactive term of firm risk and leverage is insignificant when *STD_ROA* is used as the risk measure. When *STD_MONRET* is used as the risk measure, the interactive term of firm risk and leverage is only significant when *BN* is used as the diversity measure. It is also consistent with the previous tests that indicated that compared with the coinsurance effect, the inefficient capital market hypothesis has a relatively larger explanatory power for the lower excess value of diversified firms.

7.2 The Sub Sample of All-equity Firms

As all-equity firms are firms with no interest bearing debt, there is no coinsurance effect for these firms. Therefore, we can isolate the effect of internal capital market on excess value using the sub-sample of all-equity diversified firms. The results are reported in Table 14. In the OLS regression and Heckman's model, the number of segments and one diversity measure (*BN*) are negatively and significantly related to the excess value, but the *RSZ* measure of diversity has only a very weak relation (insignificant) with the excess value. In the fixed effect estimation, both diversity measures are negatively and significantly associated with the excess value. In sum, the diversity measures can explain

part of the variation in the excess value of all-equity firms, and the level of diversification can destroy firm value through ways other than its connection with firm risk.

7.3 The Sub Sample of Pseudo Conglomerates

All segments of pseudo-conglomerates share the same four-digit SIC code, therefore, there is no diversity in investment opportunities for these firms (at least in the RSZ and BN sense). We can isolate the coinsurance effect for pseudo-conglomerates. As shown in Table 15, the sign of the number of segments is still negative, but the explanatory power of *NSEG* is lower after the risk measures are included. This is consistent with the previous finding that number of segments affects firm value through its connection with firm risk. For the OLS regression and Heckman's model, leverage, risk measures, and their interactive term are not significantly related to firm value. For fixed effect estimation, the risk measure *STD_ROA* is positively related to firm value, while the risk measure *STD_MONRET* is negatively related to firm value. Both leverage and its interactive term with risk measures are at most significantly related to firm value at the 10 percent level. In conclusion, the coinsurance effect does not have much influence on the excess value of pseudo-conglomerates.

7.4 Robustness Check

I use two other risk measures (*STD_OCF* and *RMSE*) and different time periods (1984-1997 and 1998-2004) to repeat all the tests in Tables 11 through 15. I also use the Herfindahl index (both revenue-based and asset-based) as another measure for the level of diversification. My robustness tests across all diversification measures, risk measures, time periods, and methodology reveal the following: First, the two diversity measures are

always negatively and significantly related to excess value, while the interactive term of leverage and risk measures are typically insignificant. It follows that diversity in investment opportunities has stronger power than coinsurance effect in explaining the excess value of diversified firms. Second, the number of segments is always negatively and significantly related to the excess value even after the inclusion of risk measures, implying that the level of diversification can affect firm value through ways other than its correlation with diversity and risk measures. Third, the leverage is positively related to firm value after the inclusion of risk and its interactive term with risk. This implies that leverage can affect firm value through ways other than the coinsurance effect.[28]

7.5 The Relationship between Change in the Excess Value and Leverage

To further test the coinsurance effect, I collect a sample of firms that diversify from single segment to multiple segments during the period 1984-2004. I divide this sample into two sub-samples based on whether firm risk increases or decreases after diversification. The results are shown in Table 16. The first column uses *STD_ROA* as a risk measure, while the second column and third column use *STD_MONRET* and *RMSE* as risk measures. There are more firms that increase their risk than decrease their risk. The results indicate that firms with higher profitability have higher excess value after diversification. I do not

[28] I also compute Altman's z and conduct my tests on a sub-sample of firms that are not likely to experience distress to do a robustness check on my results involving coinsurance effects (Tables 11-16). Altman's z is computed as working capital*1.2 + retained earnings*1.4 + EBIT*3.3 + Sales*0.999)/TA + MV of equity*0.6/BV of TL. Specifically, in terms of Compustat data items, it is computed as data4-data5)* 1.2 + data36*1.4 + data178*3.3 + data12*0.999)/data6 + ((data199*data25)/(data5+data9))*0.6. If the score is above 3.0, then bankruptcy is not likely; if it is less than 1.8, than bankruptcy is likely. The size of this sub-sample is about half of the whole sample for all diversified firms and pseudo conglomerates and is about the same for all-equity firms. I find that while the two diversity measures are still negatively significant, the interactive term of firm risk and leverage is not significant, just as in the whole sample. It is noteworthy that the leverage is no more significant in most of the cases in this sub-sample. For all-equity diversified firms and pseudo conglomerates, the results in the sub-sample are basically the same as those in the full sample of these firms.

find a significant relationship between the change in excess value and leverage. For firms that increase the risk, the higher leverage leads to lower excess value when *STD_MONRET* are used as the risk measure, while for firms that decrease the risk, higher leverage is related to higher excess value. This is inconsistent with the coinsurance hypothesis that an increase in firm risk causes a wealth transfer from bondholders to shareholders and a decrease in firm risk causes a wealth transfer from shareholders to bondholders.

8. Conclusion

The existing literature suggests that the diversification discount can be partially explained by internal capital market inefficiency as well as lower firm risk of diversified firms. The internal capital market inefficiency affects firm value through power struggle and rent seeking. In contrast, lower firm risk combined with the leverage only causes a wealth transfer from shareholders to bondholders and should not affect the firm value as a whole. As an important variable that drives internal capital market inefficiency, the diversity in investment opportunities is likely to be correlated with the firm risk. My primary objective in this paper is to separate the effect of the internal capital market inefficiency from the effect of the lower firm risk on excess value. To make my tests complete, I also isolate these effects by studying all-equity multi-segment firms and pseudo- conglomerates. From both the full sample and the two sub-samples, I find that diversity in investment opportunity is always negatively and significantly related to firm value. However, firm risk measures and their interactive term with leverage are generally not significant. An interpretation of these results is that diversity in investment opportunities is more important in determining the excess value of diversified firms than the coinsurance effect.

The previous research finds that the number of segments is negatively correlated with excess value. The number of the segments is also correlated with firm risk and diversity; therefore, it can affect excess value through firm risk, diversity, or other factors such as synergies. By controlling for firm risk and diversity, we can get a clearer picture of how and to what extent the number of segments (or the level of diversification) affects firm value. I find that the number of segments is still negatively associated with firm value, implying that the level of diversification destroys firm value through ways other than firm risk and diversity.

For some firms, firm risk decreases after diversification. In this case, under the coinsurance effect, leverage will be negatively related to excess value. However, there are other firms for whom firm risk increases after diversification, and there will be a wealth transfer from bondholders to shareholders for these firms. I collect a sample of firms that diversify from single segment firms to multiple segment firms during 1984-2004. I divide these firms into two sub-samples based on whether the firm risk increases or decreases around the diversification event. I do not find any evidence in support of the coinsurance effect. When standard deviation of monthly return is used as the risk measure, the relationship between the leverage and the change in firm value is negative when risk increases after diversification, and this relationship is positive for firms that decrease their risk after diversification for all risk measures. The results based on the change of firm risk around diversification corroborate my main findings that coinsurance effect is not very powerful in explaining the cross-sectional variations of the excess value in diversified firms.

It is worth noting that the number of segments is negatively correlated with diversity in investment opportunity measures for diversified firms. The correlation matrix

shows that the more diversified a firm is, the lower is the diversity in investment opportunities. This is in stark contrast to the spin-off literature which contends that as the number of segments decreases, the diversity of investment opportunities also drops. However, as some of the literature suggests, the drop in diversity of investment opportunities usually happens when a firm performs poorly prior to the spin-off. If the firm performs well before the spin-off, it is not clear how the level of diversification is related to diversity. Do diversified firms with more segments have a more efficient internal capital market than diversified firms with fewer segments? How does the increase in the number of segments affect the diversity as well as the internal capital markets? These are some interesting questions for future research.

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Table 1
The Distribution of Excess Value by Year

This table displays summary statistics for the estimated excess value using sales multipliers by year. The table includes 66,424 firm-year observations from 1984 through 2004. 46,561 of them are single segment firm years and 19,863 are multiple segment firm years. Excess value is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales.

Year	Total Sample			Single Segment			Multiple Segment		
	Number	Mean	Median	Number	Mean	Median	Number	Mean	Median
1984	2605	-0.050	-0.041	1577	0.018	0.000	1028	-0.155	-0.186
1985	2636	-0.047	-0.050	1669	0.007	0.000	967	-0.140	-0.192
1986	2690	-0.034	-0.020	1781	0.006	0.000	909	-0.113	-0.121
1987	2852	-0.012	0.000	1968	0.009	0.000	884	-0.059	-0.056
1988	2800	-0.015	0.000	1960	0.006	0.000	840	-0.063	-0.078
1989	2740	-0.007	0.000	1961	0.014	0.000	779	-0.060	-0.054
1990	2726	-0.013	0.000	1964	0.008	0.000	762	-0.067	-0.063
1991	2805	-0.037	-0.013	2039	-0.015	0.000	766	-0.096	-0.101
1992	3070	-0.031	-0.007	2268	-0.010	0.000	802	-0.089	-0.104
1993	3405	-0.033	-0.010	2588	-0.007	0.000	817	-0.118	-0.096
1994	3732	-0.030	-0.011	2865	-0.006	0.000	867	-0.109	-0.122
1995	4001	-0.033	-0.010	3120	-0.016	0.000	881	-0.092	-0.093
1996	4298	-0.019	0.000	3432	-0.003	0.000	866	-0.085	-0.085
1997	4467	-0.024	0.000	3634	-0.013	0.000	833	-0.073	-0.073
1998	3874	-0.040	-0.014	2590	-0.035	0.000	1284	-0.050	-0.072
1999	3327	-0.076	-0.042	2042	-0.045	0.000	1285	-0.125	-0.121
2000	3176	-0.060	-0.032	2038	-0.028	0.000	1138	-0.117	-0.136
2001	2967	-0.040	-0.016	1880	0.000	0.000	1087	-0.108	-0.117
2002	2929	-0.016	0.000	1831	0.004	0.000	1098	-0.050	-0.062
2003	2832	-0.060	-0.027	1778	0.004	0.000	1054	-0.170	-0.192
2004	2492	-0.070	-0.054	1576	-0.003	0.000	916	-0.185	-0.183
Total	66424	-0.035	-0.013	46561	-0.006	0.000	19863	-0.102	-0.109

Table 2
The Distribution of Excess Value of All-Equity Firms by Year

This table displays summary statistics for the estimated excess value of all-equity firms using sales multipliers by year. All-equity firms are defined as those firms with interest bearing debt (long-term debt and debt in current liabilities) to total assets ratio less than one percent. The table includes 8,735 firm-year observations from 1984 through 2004. 7,363 of them are single segment firm years and 1,372 are multiple segment firm years. Excess value is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales.

Year	Total Sample			Single Segment			Multiple Segment		
	Number	Mean	Median	Number	Mean	Median	Number	Mean	Median
1984	160	0.153	0.125	124	0.210	0.184	36	-0.042	-0.066
1985	170	0.110	0.126	136	0.139	0.148	34	-0.006	-0.039
1986	166	0.113	0.120	130	0.178	0.144	36	-0.121	-0.057
1987	188	0.145	0.084	154	0.199	0.154	34	-0.096	-0.113
1988	183	0.125	0.173	154	0.157	0.221	29	-0.044	0.066
1989	205	0.193	0.169	171	0.201	0.172	34	0.156	0.097
1990	204	0.132	0.107	174	0.154	0.117	30	0.005	-0.123
1991	271	0.149	0.130	240	0.146	0.130	31	0.177	0.170
1992	348	0.174	0.214	306	0.193	0.223	42	0.037	0.161
1993	441	0.146	0.124	393	0.172	0.149	48	-0.072	-0.126
1994	498	0.118	0.069	437	0.147	0.118	61	-0.088	-0.099
1995	547	0.085	0.054	494	0.097	0.059	53	-0.030	-0.034
1996	632	0.104	0.095	580	0.108	0.097	52	0.064	0.008
1997	711	0.069	0.057	653	0.081	0.066	58	-0.071	0.003
1998	590	0.079	0.096	504	0.106	0.113	86	-0.081	-0.002
1999	481	-0.015	0.000	380	0.022	0.019	101	-0.156	-0.311
2000	523	0.062	0.032	438	0.091	0.076	85	-0.091	-0.182
2001	547	0.081	0.046	441	0.105	0.071	106	-0.017	-0.053
2002	610	0.074	0.058	468	0.100	0.078	142	-0.013	-0.049
2003	650	0.067	0.058	500	0.145	0.121	150	-0.194	-0.233
2004	610	0.067	0.063	486	0.112	0.086	124	-0.111	-0.105
Total	8735	0.093	0.081	7363	0.122	0.104	1372	-0.063	-0.078

Table 3
The Distribution of Excess Value of Pseudo-Conglomerate Firms by Year

This table displays summary statistics for the estimated excess value of pseudo-conglomerate firms using sales multipliers by year. Pseudo-conglomerates are diversified firms that have all divisions operate in the same finely defined industry, i.e., all segments share the same four-digit SIC code. The table includes 19,863 firm-year observations from 1984 through 2004. 17,391 of them are real conglomerate firm years and 2,472 are pseudo-conglomerate firm years. Excess value is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales.

Year	Real Conglomerate			Pseudo Conglomerate		
	Number	Mean	Median	Number	Mean	Median
1984	1003	-0.155	-0.187	25	-0.129	-0.100
1985	940	-0.144	-0.194	27	0.002	0.042
1986	889	-0.119	-0.130	20	0.141	0.163
1987	856	-0.061	-0.059	28	-0.001	-0.011
1988	810	-0.069	-0.098	30	0.105	0.188
1989	751	-0.061	-0.059	28	-0.028	-0.018
1990	733	-0.066	-0.065	29	-0.082	0.014
1991	731	-0.093	-0.101	35	-0.165	-0.133
1992	763	-0.080	-0.086	39	-0.266	-0.227
1993	768	-0.111	-0.086	49	-0.220	-0.152
1994	812	-0.111	-0.124	55	-0.075	-0.029
1995	821	-0.102	-0.103	60	0.045	0.080
1996	802	-0.089	-0.091	64	-0.037	-0.050
1997	761	-0.080	-0.074	72	-0.007	-0.048
1998	1033	-0.053	-0.078	251	-0.041	-0.042
1999	1019	-0.117	-0.109	266	-0.157	-0.173
2000	900	-0.100	-0.120	238	-0.182	-0.217
2001	830	-0.120	-0.130	257	-0.070	-0.069
2002	787	-0.059	-0.061	311	-0.028	-0.066
2003	744	-0.169	-0.174	310	-0.171	-0.213
2004	638	-0.192	-0.170	278	-0.170	-0.203
Total	17391	-0.102	-0.111	2472	-0.103	-0.100

Table 4
Summary Statistics for Multiple Segment Firms and Single Segment Firms

This table displays descriptive statistics for the multiple segment firms and single segment firms. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. *NSEG* is the number of business segments a firm has, *ASSETS* is the book value of total assets, *SALES* is the book value of total sales, *EBIT/SALES* is the ratio of EBIT to total sales, *NPM* is the ratio of NI to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *CAPX/TA* is the ratio of capital expenditures to total assets, *LEVER* is the ratio of interest bearing debt to total assets, *LTDLEVER* is the ratio of long-term debt to total assets, and *R&D/SALES* is the ratio of R&D expenditures to total sales. The table includes 66,424 firm-year observations from 1984 through 2004. 46,561 of these firm-year observations belong to single segment firms. The remaining 19,863 observations belong to multiple segment firms.

Variable	Multiple (N=19,863)			Single (N=46,561)			Difference (Multiple – Single)	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-Stat	Z-Stat
EXVAL	-0.102	-0.109	0.564	-0.006	0.000	0.584	-19.84[a]	-19.81[a]
NSEG	2.831	3.000	1.076	1.000	1.000	0.000	239.94[a]	253.18[a]
ASSETS ($ m.)	2366.680	395.865	7349.360	937.457	132.413	4075.920	25.77[a]	60.58[a]
SALES ($ m.)	2142.480	415.151	7118.280	873.147	142.053	4086.470	23.53[a]	62.37[a]
EBIT/SALES	0.073	0.073	0.085	0.067	0.068	0.103	8.36[a]	6.39[a]
NPM	0.005	0.033	0.404	-0.022	0.033	0.463	7.45[a]	-0.66
CAPX/SALES	0.069	0.043	0.073	0.078	0.044	0.087	-13.28[a]	-0.40
CAPX/TA	0.064	0.049	0.060	0.076	0.052	0.082	-21.51[a]	-8.64[a]
LEVER	0.296	0.278	0.237	0.261	0.224	0.271	16.43[a]	26.84[a]
LTDLEVER	0.231	0.209	0.211	0.198	0.141	0.240	17.81[a]	31.39[a]
R&D/SALES	0.020	0.000	0.066	0.046	0.000	0.166	-28.68[a]	-3.79[a]

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level.

Table 5
Summary Statistics for All-Equity Firms

This table displays descriptive statistics for the all-equity multiple segment firms and all-equity single segment firms. All-equity firms are defined as those firms with an interest bearing debt (long-term debt and debt in current liabilities) to total assets ratio less than one percent. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. *NSEG* is the number of business segments a firm has, *ASSETS* is the book value of total assets, *SALES* is the book value of total sales, *EBIT/SALES* is the ratio of EBIT to total sales, *NPM* is the ratio of NI to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *CAPX/TA* is the ratio of capital expenditures to total assets, *LEVER* is the ratio of interest bearing debt to total assets, *LTDLEVER* is the ratio of long-term debt to total assets, and *R&D/SALES* is the ratio of R&D expenditures to total sales. The table includes 8,735 firm-year observations from 1984 through 2004. 7,363 of these firm-year observations belong to all-equity single segment firms. The remaining 1,372 observations belong to all-equity multiple segment firms.

Variable	Multiple (N=1,372)			Single (N=7,363)			Difference (Multiple – Single)	
	Mean	Median	Std Dev	Mean	Median	Std Dev	T-Stat	Z-Stat
EXVAL	-0.063	-0.078	0.659	0.122	0.104	0.647	-9.67[a]	-9.52[a]
NSEG	2.464	2.000	0.784	1.000	1.000	0.000	69.13[a]	93.14[a]
ASSETS ($ m.)	393.126	123.026	1279.210	251.881	84.443	1019.200	3.87[a]	8.46[a]
SALES ($ m.)	430.110	124.726	1345.410	295.607	84.148	1151.840	3.47[a]	9.51[a]
EBIT/SALES	0.046	0.075	0.209	0.032	0.083	0.342	1.95[c]	-2.67[a]
NPM	0.010	0.053	0.272	-0.029	0.057	0.754	3.34[a]	-2.45[b]
CAPX/SALES	0.063	0.033	0.114	0.065	0.038	0.129	-0.55	-3.54[a]
CAPX/TA	0.057	0.039	0.072	0.059	0.042	0.073	-1.04	-2.26[b]
LEVER	0.002	0.000	0.003	0.001	0.000	0.002	4.85[a]	4.81[a]
LTDLEVER	0.001	0.000	0.002	0.001	0.000	0.002	4.95[a]	4.79[a]
R&D/SALES	0.053	0.007	0.112	0.101	0.046	0.178	-13.17[a]	-10.98[a]

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level.

Table 6
Summary Statistics for Pseudo-Conglomerate Firms and Real Conglomerate Firms

This table displays descriptive statistics for pseudo-conglomerate firms and real conglomerate firms. Pseudo-conglomerates are diversified firms that have all divisions operate in the same finely defined industry, i.e., all segments share the same four-digit SIC code. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its segments, with each segment's imputed value equal to the segment's sale multiplied by its industry median ratio of capital to sales. *NSEG* is the number of business segments a firm has, *ASSETS* is the book value of total assets, *SALES* is the book value of total sales, *EBIT/SALES* is the ratio of EBIT to total sales, *NPM* is the ratio of NI to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *CAPX/TA* is the ratio of capital expenditures to total assets, *LEVER* is the ratio of interest bearing debt to total assets, *LTDLEVER* is the ratio of long-term debt to total assets, and *R&D/SALES* is the ratio of R&D expenditures to total sales. The table includes 19,863 firm-year observations from 1984 through 2004. 2,472 of these firm-year observations belong to pseudo-conglomerate firms. The remaining 17,391 observations belong to real conglomerate firms.

Variable	Pseudo Conglomerates (N=2,472)			Real Conglomerates (N=17,391)			Difference (Pseudo – Real)	
	Mean	Median	Std Dev	Mean	Median	Std Dev	T-Stat	Z-Stat
EXVAL	-0.103	-0.100	0.629	-0.102	-0.111	0.554	-0.03	-0.12
NSEG	2.525	2.000	0.986	2.875	3.000	1.081	-16.28[a]	-18.87[a]
ASSETS ($ m.)	1608.910	289.796	4602.190	2474.390	416.310	7654.300	-7.92[a]	-8.36[a]
SALES ($ m.)	1369.410	277.681	3977.770	2252.370	442.710	7451.660	-9.01[a]	-10.67[a]
EBIT/SALES	0.060	0.066	0.100	0.075	0.073	0.082	-7.41[a]	-6.20[a]
NPM	-0.037	0.028	0.370	0.011	0.034	0.409	-5.94[a]	-6.42[a]
CAPX/SALES	0.070	0.041	0.079	0.069	0.043	0.072	0.77	-3.01[a]
CAPX/TA	0.062	0.043	0.068	0.064	0.050	0.058	-1.02	-6.92[a]
LEVER	0.278	0.257	0.306	0.298	0.281	0.225	-3.06[a]	-6.54[a]
LTDLEVER	0.216	0.191	0.272	0.233	0.211	0.201	-3.06[a]	-6.95[a]
R&D/SALES	0.040	0.000	0.136	0.017	0.000	0.047	8.19[a]	6.29[a]

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level.

Table 7
The Distribution of the Value of Diversity in Investment Opportunities by Year

This table displays summary statistics for the value of diversity in investment opportunities by year. The table includes 22,259 firm-year observations from 1984 through 2004. The diversity in investment opportunities is computed as a variant of the Rajan et al. (2000) measure, which is the standard deviation of asset-weighted segment q's:

$$\text{Diversity}=\sqrt{\sum_{j=1}^{n}\frac{(w_j q_j \quad \overline{wq})^2}{n \quad 1}},$$

I also compute the diversity in investment opportunities using the Burch and Nanda (2003) measure, which is the asset-weighted standard deviation of equally-weighted segment Qs:

$$\text{Diversity}=\sqrt{\sum_{j=1}^{n}\frac{w_j(q_j-\overline{q})^2}{n-1}}$$

Year	RSZ Measure			BN Measure		
	Number	Mean	Median	Number	Mean	Median
1984	1094	0.301	0.262	1094	0.116	0.089
1985	1007	0.302	0.263	1007	0.121	0.083
1986	971	0.301	0.265	971	0.122	0.082
1987	929	0.300	0.272	929	0.093	0.063
1988	921	0.301	0.268	921	0.088	0.058
1989	894	0.308	0.267	894	0.118	0.080
1990	879	0.312	0.275	879	0.107	0.074
1991	863	0.313	0.277	863	0.149	0.100
1992	913	0.306	0.276	913	0.139	0.091
1993	906	0.310	0.283	906	0.145	0.106
1994	937	0.303	0.267	937	0.124	0.097
1995	972	0.305	0.269	972	0.150	0.098
1996	964	0.303	0.268	964	0.159	0.104
1997	903	0.305	0.265	903	0.157	0.107
1998	1406	0.302	0.270	1406	0.121	0.070
1999	1502	0.313	0.265	1502	0.231	0.081
2000	1392	0.312	0.269	1392	0.140	0.071
2001	1304	0.316	0.272	1304	0.140	0.068
2002	1237	0.321	0.281	1237	0.086	0.043
2003	1237	0.308	0.274	1237	0.132	0.067
2004	1028	0.310	0.271	1028	0.126	0.069
Total	22259	0.308	0.270	22259	0.134	0.080

Table 8
Summary Risk Statistics for Multiple-Segment Firms

This table provides summary statistics for four measures of firm risk of multi-segment firms. *STD_OCF* is the standard deviation of operating cash flow, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly return, and *RMSE* is the standard deviation of the residuals from the single factor market model based on weekly returns.

Variable	Number	Mean	Median	Std. Dev
STD_OCF	8,329	0.038	0.029	0.034
STD_ROA	8,329	0.014	0.010	0.013
STD_MONRET	16,466	0.125	0.104	0.085
RMSE	16,466	0.063	0.052	0.041

Table 9

Correlation Matrix of the Number of Segments, Risk Measures, and Diversity Measures

This table displays the correlation matrix of the number of segments, risk measures, and diversity measures. *NSEG* is the number of business segments a firm has, *STD_OCF* is the standard deviation of operating cash flow, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly return, and *RMSE* is the standard deviation of the residuals from the single factor market model based on weekly returns, *RSZ* is the standard deviation of asset-weighted segment q's and BN is the asset-weighted standard deviation of equally weighted segment q's.

	NSEG	STD_OCF	STD_ROA	MONRET	RMSE	RSZ	BN
NSEG	1	-0.081[a]	-0.097[a]	-0.088[a]	-0.121[a]	-0.387[a]	-0.053[a]
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
	16,466	8,329	8,329	16,466	16,466	13,406	13,406
STD_OCF		1	0.427[a]	0.206[a]	0.267[a]	-0.009	0.012
			<.0001	<.0001	<.0001	0.4725	0.3094
		8,329	8,329	8,329	8,329	6,914	6,914
STD_ROA			1	0.272[a]	0.323[a]	0.053[a]	0.036[a]
				<.0001	<.0001	<.0001	0.0024
			8,329	8,329	8,329	6,914	6,914
STD_MONRET				1	0.792[a]	0.071[a]	0.042[a]
					<.0001	<.0001	<.0001
				16,466	16,466	13,406	13,406
RMSE					1	0.073[a]	0.034[a]
						<.0001	<.0001
					16,466	13,406	13,406
RSZ						1	0.057[a]
							<.0001
						13,406	13,406
BN							1
							13,406

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level

Table 10
Probit Estimates for Firms to be a Diversified Firm, an All-Equity Firm, and a Pseudo-Conglomerate

The dependent variable Dummy takes the value of 1 when the firm is a diversified firm (an all-equity firm, a pseudo-conglomerate) and 0 if it is a focused firm (a levered firm, a real conglomerate). *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *DIVIDEND* is the total dividend paid, *R&D/TA* is the ratio of R&D to total assets, *INDQ* is the industry q, *S&P* is a dummy that takes the value of 1 if a firm is part of the S&P index and 0 otherwise, *MAJOREX* is a dummy that takes the value of 1 if the firm is listed on Nasdaq, NYSE, or AMEX, and 0 otherwise, *FOREIGN* is a dummy that takes the value of 1 if the firm is incorporated outside of the U.S., and 0 otherwise. *PNDIV (PVALEQ, PNPSEU)* is a fraction of all firms in the industry that are diversified firms (all-equity firms, pseudo-conglomerates), *PSDIV(PSALEQ, PSPSEU)* is the fraction of industry sales accounted for by diversified firms (all-equity firms, pseudo-conglomerates). *NMERGER* is the number of announced mergers/acquisitions in the year, while *MVOL* is the U.S. dollar value of these mergers/acquisitions. *GROWTH* is the growth rate in real GDP, while the variable *CONTRACTION* is the number of months in the year that the economy was in a recession.

Variable	Dummy		
	Diversified firm	All-equity firm	Pseudo-conglomerate
LSIZE	0.151 [a]	-0.193 [a]	-0.050 [b]
	(0.00)	(0.00)	(0.04)
EBIT/SALES	-1.093 [a]	2.274 [a]	0.459
	(0.00)	(0.00)	(0.22)
CAPX/SALES	-0.911 [a]	0.854 [c]	0.411
	(0.00)	(0.09)	(0.36)
DIVIDEND	0.000	-0.002	0.000
	(0.41)	(0.14)	(0.50)
R&D/TA	-1.588 [a]	1.580 [a]	0.956 [c]
	(0.00)	(0.00)	(0.06)
INDQ	0.147 [a]	-0.092	-0.042
	(0.00)	(0.12)	(0.40)
S&P	0.007	-0.430 [b]	-0.103
	(0.93)	(0.03)	(0.47)
PNDIV(PNALEQ, PNPSEU)	3.011 [a]	5.662 [a]	4.513 [a]
	(0.00)	(0.00)	(0.00)
PSDIV(PSALEQ, PSPSEU)	0.040	-0.317	-0.091
	(0.57)	(0.26)	(0.56)
MVOL	0.000	0.000	0.000
	(0.15)	(0.14)	(0.96)
NMERGER	-0.000 [b]	-0.000	0.000
	(0.04)	(0.69)	(0.12)
GROWTH	0.019 [a]	-0.027	-0.016
	(0.00)	(0.12)	(0.30)
CONTRACTION	0.004 [c]	-0.001	-0.001
	(0.06)	(0.92)	(0.88)
MAJOREX	-0.024	0.490 [a]	0.059
	(0.59)	(0.00)	(0.52)
FOREIGN	0.038	-0.010	0.056
	(0.51)	(0.95)	(0.59)
LAGE	0.242 [a]	-0.016	-0.131 [a]
	(0.00)	(0.68)	(0.00)

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level

Table 11
OLS Regression Results for All Diversified Firms

This table contains OLS results from regressing excess value on the number of segments, diversity, firm risk and various control variables. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. *NSEG* is the number of business segments a firm has, *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *LEVER* is the ratio of interest bearing debt to total assets, *RSZ* is the standard deviation of asset-weighted segment Qs and BN is the asset-weighted standard deviation of equally weighted segment Qs, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly return. Column 1 gives results without the inclusion of diversity and risk measures. Column 2 adds diversity measure as another control variable. Column 3 (column 5) add *STD_ROA* (*STD_MONRET*) as the risk measure. Column 4 and column 6 also include the interactive variable of firm risk and leverage.

	OLS regression (RSZ)						OLS regression (BN)				
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	-0.483[a]	-0.434[a]	-0.516[a]	-0.514[a]	-0.588[a]	-0.541[a]	-0.508[a]	-0.579[a]	-0.570[a]	-0.653[a]	-0.594[a]
	(-31.54)	(-21.87)	(-14.99)	(-14.06)	(-23.65)	(-19.17)	(-29.15)	(-18.02)	(-16.44)	(-28.03)	(-21.87)
NSEG	-0.027[a]	-0.041[a]	-0.035[a]	-0.035[a]	-0.040[a]	-0.040[a]	-0.026[a]	-0.017[a]	-0.017[a]	-0.024[a]	-0.024[a]
	(-7.31)	(-9.60)	(-5.20)	(-5.20)	(-8.54)	(-8.44)	(-6.42)	(-2.70)	(-2.71)	(-5.31)	(-5.29)
LSIZE	0.034[a]	0.036[a]	0.048[a]	0.048[a]	0.048[a]	0.048[a]	0.037[a]	0.047[a]	0.047[a]	0.049[a]	0.048[a]
	(13.95)	(14.04)	(11.66)	(11.66)	(16.45)	(16.39)	(14.33)	(11.56)	(11.57)	(16.58)	(16.51)
EBIT/SALES	1.707[a]	1.746[a]	1.738[a]	1.739[a]	1.973[a]	1.983[a]	1.717[a]	1.685[a]	1.689[a]	1.922[a]	1.937[a]
	(30.64)	(28.36)	(18.01)	(17.99)	(28.10)	(28.23)	(27.92)	(17.53)	(17.54)	(27.47)	(27.66)
CAPX/SALES	1.137[a]	1.155[a]	0.984[a]	0.985[a]	1.062[a]	1.076[a]	1.027[a]	0.840[a]	0.843[a]	0.916[a]	0.936[a]
	(17.68)	(16.83)	(9.32)	(9.32)	(14.13)	(14.30)	(15.09)	(8.01)	(8.04)	(12.28)	(12.53)
LEVER	0.170[a]	0.233[a]	0.197[a]	0.189[a]	0.168[a]	-0.004	0.235[a]	0.186[a]	0.149[a]	0.169[a]	-0.038
	(7.90)	(9.78)	(5.24)	(2.99)	(6.25)	(-0.07)	(9.87)	(4.92)	(2.36)	(6.27)	(-0.68)
RSZ		-0.227[a]	-0.260[a]	-0.260[a]	-0.252[a]	-0.247[a]					
		(-11.83)	(-8.69)	(-8.68)	(-11.95)	(-11.69)					
BN							-0.355[a]	-0.408[a]	-0.409[a]	-0.396[a]	0.395[a]
							(-11.10)	(-8.50)	(-8.51)	(-11.45)	(-11.41)
STD_ROA(STD_MONRET)			1.557[a]	1.405	0.807[a]	0.433[a]		1.145[c]	0.505	0.724[a]	0.278[b]
			(2.36)	(1.27)	(10.80)	(3.31)		(1.74)	(0.46)	(9.76)	(2.15)
STD_ROA(STD_MONRET) *LEVER				0.596		1.237[a]			2.513		1.484[a]
				(0.17)		(3.49)			(0.72)		(4.20)
N	19,631	15,980	6,824	6,824	13,236	13,236	15,980	6,824	6,824	13,236	13,236
R^2	0.123	0.142	0.147	0.147	0.152	0.152	0.141	0.147	0.147	0.151	0.152

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level

Table 12
GLM Regression Results for All Diversified Firms

This table contains GLM results from regressing excess value on the number of segments, diversity, firm risk and various control variables. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. *NSEG* is the number of business segments a firm has, *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *LEVER* is the ratio of interest bearing debt to total assets, *RSZ* is the standard deviation of asset-weighted segment Qs and BN is the asset-weighted standard deviation of equally weighted segment Qs, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly return. Column 1 gives results without the inclusion of diversity and risk measures. Column 2 adds diversity measure as another control variable. Column 3 (column 5) add *STD_ROA* (*STD_MONRET*) as the risk measure. Column 4 and column 6 also include the interactive variable of firm risk and leverage.

Variable	Fixed Firm Effects (RSZ)						Fixed Firm Effects (BN)				
	(1)	(2)	(3)	(4)	(5)	(6)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	-0.477	-0.230	-1.059 [a]	-1.067 [a]	-1.052 [a]	-1.020 [a]	-0.355	-1.083 [a]	-1.087 [a]	-1.069 [a]	-1.027 [a]
	(-1.33)	(-0.67)	(-5.10)	(-5.13)	(-5.05)	(-4.88)	(-1.04)	(-5.20)	(-5.21)	(-5.12)	(-4.90)
NSEG	-0.023 [a]	-0.033 [a]	-0.042 [a]	-0.042 [a]	-0.042 [a]	-0.042 [a]	-0.019 [a]	-0.025 [a]	-0.025 [a]	-0.025 [a]	-0.025 [a]
	(-5.42)	(-6.92)	(-5.59)	(-5.59)	(-5.60)	(-5.54)	(-4.07)	(-3.41)	(-3.41)	(-3.43)	(-3.37)
LSIZE	0.066 [a]	0.051 [a]	0.105 [a]	0.105 [a]	0.104 [a]	0.104 [a]	0.049 [a]	0.105 [a]	0.105 [a]	0.105 [a]	0.105 [a]
	(8.51)	(6.06)	(7.12)	(7.13)	(7.09)	(7.08)	(5.78)	(7.15)	(7.15)	(7.09)	(7.09)
EBIT/SALES	1.617 [a]	1.672 [a]	1.743 [a]	1.733 [a]	1.745 [a]	1.751 [a]	1.620 [a]	1.695 [a]	1.690 [a]	1.695 [a]	1.704 [a]
	(25.04)	(23.23)	(15.57)	(15.34)	(15.62)	(15.67)	(22.53)	(15.15)	(14.96)	(15.18)	(15.26)
CAPX/SALES	1.549 [a]	1.566 [a]	1.392 [a]	1.392 [a]	1.387 [a]	1.398 [a]	1.517 [a]	1.399 [a]	1.399 [a]	1.394 [a]	1.407 [a]
	(17.54)	(16.64)	(10.03)	(10.03)	(9.98)	(10.05)	(16.11)	(10.06)	(10.06)	(10.01)	(10.10)
LEVER	0.335 [a]	0.428 [a]	0.414 [a]	0.447 [a]	0.419 [a]	0.309 [a]	0.422 [a]	0.400 [a]	0.418 [a]	0.404 [a]	0.265 [a]
	(11.11)	(12.94)	(7.92)	(5.96)	(7.95)	(3.77)	(12.72)	(7.62)	(5.55)	(7.66)	(3.22)
RSZ		-0.313 [a]	-0.367 [a]	-0.367 [a]	-0.366 [a]	-0.364 [a]					
		(-14.33)	(-11.09)	(-11.09)	(-11.06)	(-11.00)					
BN							-0.416 [a]	-0.475 [a]	-0.475 [a]	-0.47 [a] 4	-0.476 [a]
							(-12.77)	(-10.18)	(-10.17)	(-10.17)	(-10.20)
STD_ROA(STD_MONRE			-0.437	0.211	-0.078	-0.380 [c]		-0.199	0.154	-0.085	-0.470[b]
T)			(-0.57)	(0.16)	(-0.69)	(1.84)		(-0.26)	(-0.12)	(-0.76)	(-2.27)
STD_ROA(STD_MONRE				-2.339		0.908 [c]			-1.274		1.158 [b]
T)*LEVER				(-0.61)		(1.74)			(0.33)		(2.22)
N	19,631	15,980	6,824	6,824	6,824	6,824	15,980	6,824	6,824	6,824	6,824
R^2	0.685	0.712	0.753	0.753	0.753	0.753	0.711	0.752	0.752	0.752	0.752

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level

Table 13
Heckman's Regression Results for All Diversified Firms

This table contains Heckman's results from regressing excess value on the number of segments, diversity, firm risk and various control variables. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. *NSEG* is the number of business segments a firm has, *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *LEVER* is the ratio of interest bearing debt to total assets, *RSZ* is the standard deviation of asset-weighted segment Qs and BN is the asset-weighted standard deviation of equally weighted segment Qs, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly return. Column 1 gives results without the inclusion of diversity and risk measures. Column 2 adds diversity measure as another control variable. Column 3 (column 5) add *STD_ROA* (*STD_MONRET*) as the risk measure. Column 4 and column 6 also include the interactive variable of firm risk and leverage.

Variable	Heckman (RSZ)						Heckman (BN)				
	(1)	(2)	(3)	(4)	(5)	(6)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	-0.555 [a]	-0.550 [a]	-0.553 [a]	-0.557 [a]	-0.622 [a]	-0.573 [a]	-0.606 [a]	-0.601 [a]	-0.598 [a]	-0.675 [a]	-0.617 [a]
	(-24.81)	(-20.87)	(-13.43)	(-12.99)	(-15.21)	(-7.48)	(-24.14)	(-15.01)	(-14.26)	(-16.93)	(-13.94)
NSEG	-0.025 [a]	-0.039 [a]	-0.037 [a]	-0.037 [a]	-0.039 [a]	-0.039 [a]	-0.023 [a]	-0.019[a]	-0.019[a]	-0.019 [a]	-0.019 [a]
	(-6.29)	(-8.49)	(-5.45)	(-5.44)	(-5.74)	(-3.50)	(-5.29)	(-2.88)	(-2.89)	(-2.96)	(-2.98)
LSIZE	0.050 [a]	0.056 [a]	0.059 [a]	0.059 [a]	0.063 [a]	0.062 [a]	0.055[a]	0.057 [a]	0.057 [a]	0.060 [a]	0.060 [a]
	(16.91)	(17.84)	(12.60)	(12.59)	(13.53)	(7.28)	(17.50)	(12.10)	(12.11)	(13.02)	(13.03)
EBIT/SALES	1.309 [a]	1.366 [a]	1.324 [a]	1.322 [a]	1.453 [a]	1.460 [a]	1.343 [a]	1.271 [a]	1.272 [a]	1.392 [a]	1.402 [a]
	(25.05)	(23.51)	(15.29)	(15.25)	(16.52)	(7.80)	(23.15)	(14.73)	(14.72)	(15.89)	(16.01)
CAPX/SALES	0.991 [a]	1.007[a]	0.992 [a]	0.991 [a]	1.012 [a]	1.027 [a]	0.899 [a]	0.873 [a]	0.874 [a]	0.881 [a]	0.900 [a]
	(16.49)	(15.87)	(10.82)	(10.80)	(11.10)	(5.92)	(14.25)	(9.58)	(9.58)	(9.73)	(9.92)
LEVER	0.123 [a]	0.191 [a]	0.186 [a]	0.200 [a]	0.140 [b]	-0.039	0.190 [a]	0.175 [a]	0.161[a]	0.133 [a]	-0.078
	(5.32)	(7.46)	(4.93)	(3.17)	(3.69)	(-0.29)	(7.43)	(4.62)	(2.55)	(3.49)	(-0.99)
RSZ		-0.241[a]	-0.271[a]	-0.271[a]	-0.290[a]	-0.285[a]					
		(-11.69)	(-8.88)	(-8.88)	(-9.51)	(-5.91)					
BN							-0.389 [a]	-0.417 [a]	-0.417 [a]	-0.433 [a]	-0.431 [a]
							(-11.44)	(-8.60)	(-8.60)	(-8.95)	(-8.92)
STD_ROA			1.393[b]	1.637	0.758[a]	0.347		1.027	0.792	0.692 [a]	0.207
(STD_MONRET)			(2.07)	(1.47)	(6.82)	(1.06)		(1.53)	(0.71)	(6.26)	(1.07)
STD_ROA(STD_MONRET)				-0.957		1.377			0.921		1.629 [a]
*LEVER				(-0.28)		(1.55)			(0.27)		(3.04)
LAMDA	0.030	0.054	0.019	0.019	0.012		0.042	0.008	0.008	-0.000	0.001
	(3.34)	(5.82)	(1.49)	(1.48)	(0.91)		(4.53)	(0.63)	(0.64)	(-0.01)	(0.08)
N	17,313	14,081	6,751	6,751	6,751	6,751	14,081	6,751	6,751	6,751	6,751
R^2	0.026	0.178	0.169	0.169	0.170	0.170	0.178	0.168	0.168	0.169	0.170

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level

Table 14
Regression Results for All-Equity Diversified Firms

This table contains results from regressing excess value on the number of segments, diversity and various control variables for all-equity diversified firms. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. *NSEG* is the number of business segments a firm has, *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *RSZ* is the standard deviation of asset-weighted segment Qs and BN is the asset-weighted standard deviation of equally weighted segment Qs. Column 1 gives results without the inclusion of diversity measures. Column 2 and column 3 add diversity measure as another control variable. The first three columns present results from the OLS regression. The next three columns provide results from the fixed firm and calendar year effects. The final three columns report results from the Heckman's two stage model.

Variable	OLS regression			Fixed effects			Heckman		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	-0.522 [a]	-0.537 [a]	-0.516 [a]	-2.597 [a]	-1.024	-1.297	-0.538 [a]	-0.578 [a]	-0.553 [a]
	(-6.53)	(-4.88)	(-5.05)	(-3.84)	(-1.05)	(-1.29)	(-6.38)	(-4.87)	(-5.08)
NSEG	-0.081 [a]	-0.089 [a]	-0.084 [a]	-0.61	-0.176 [a]	-0.092	-0.078 [a]	-0.080 [a]	-0.073 [b]
	(-3.70)	(-3.20)	(-3.14)	(-1.50)	(-2.77)	(-1.44)	(-3.39)	(-2.67)	(-2.54)
LSIZE	0.094 [a]	0.095 [a]	0.092 [a]	0.320 [a]	0.221 [b]	0.185 [c]	0.104 [a]	0.105 [a]	0.100 [a]
	(6.75)	(5.56)	(5.45)	(5.51)	(2.26)	(1.83)	(6.96)	(5.63)	(5.44)
EBIT/SALES	1.595 [a]	1.599 [a]	1.616 [a]	1.573 [a]	1.961 [a]	1.660 [a]	1.658 [a]	1.587 [a]	1.634 [a]
	(8.04)	(6.13)	(6.22)	(5.96)	(5.03)	(4.15)	(7.96)	(5.71)	(5.91)
CAPX/SALES	1.546 [a]	1.704 [a]	1.667 [a]	-0.764	0.120	-0.120	1.683 [a]	1.767 [a]	1.695 [a]
	(5.14)	(4.66)	(4.58)	(-1.61)	(-0.19)	(-0.19)	(5.40)	(4.64)	(4.48)
RSZ		-0.080			-0.800 [a]			-0.097	
		(-0.96)			(-5.46)			(-1.12)	
BN			-0.417 [b]			-0.382 [c]			-0.524 [b]
			(-2.86)			(-1.71)			(-3.49)
LAMBDA							-0.059 [b]	-0.027	-0.018
							(-2.22)	(-0.80)	(-0.56)
N	1,363	785	785	1,363	785	785	1,266	728	728
R^2	0.120	0.132	0.140	0.792	0.839	0.827	0.022	0.345	0.347

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level.

Table 15
Regression Results for Pseudo Conglomerate Firms

This table contains results from regressing excess value on the number of segments, firm risk and various control variables. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. *NSEG* is the number of business segments a firm has, *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *LEVER* is the ratio of interest bearing debt to total assets, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly returns. Column 1 gives results without the inclusion of risk measures. Column 2 (column 4) add *STD_ROA* (*STD_MONRET*) as the risk measure. Column 3 and column 5 also include the interactive variable of firm risk and leverage. The first five columns present results from the OLS regression. The next five columns provide results from the fixed firm and calendar year effects. The final five columns report results from Heckman's two stage model.

Variable	OLS regression					Fixed effects					Heckman				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Intercept	-0.438 [a]	-0.388 [a]	-0.392 [a]	-0.528 [a]	-0.523 [a]	-1.434 [a]	-1.638 [a]	-1.706 [a]	-1.485 [a]	-1.391 [a]	-0.442 [a]	-0.320[a]	-0.320[a]	-0.377 [a]	-0.350[a]
	(-8.69)	(-3.54)	(-3.45)	(-7.42)	(-6.35)	(-5.02)	(-3.09)	(-3.22)	(-2.78)	(-2.60)	(-7.97)	(-2.81)	(-2.71)	(-3.36)	(-2.66)
NSEG	-0.046 [a]	-0.048 [c]	-0.048 [c]	-0.042 [a]	-0.04 2[a]	-0.068 [a]	-0.091	-0.094 [c]	-0.080	-0.083	-0.041[a]	-0.046[c]	-0.046[c]	-0.048[c]	-0.048[c]
	(-3.71)	(-1.87)	(-1.87)	(-2.91)	(-2.91)	(-3.49)	(-1.69)	(-1.75)	(-1.50)	(-1.54)	(-3.12)	(-1.78)	(-1.78)	(-1.84)	(-1.84)
LSIZE	0.042 [a]	0.036 [b]	0.036 [a]	0.051 [a]	0.051 [a]	0.128 [a]	0.180 [a]	0.178 [a]	0.183 [a]	0.184 [a]	0.047 [a]	0.038[a]	0.038[b]	0.041[a]	0.041[a]
	(5.21)	(2.51)	(2.50)	(5.44)	(5.43)	(4.09)	(2.79)	(2.76)	(2.84)	(2.86)	(5.44)	(2.60)	(2.59)	(2.83)	(2.81)
EBIT/SALES	1.432 [a]	1.979 [a]	1.977 [a]	1.592 [a]	1.593 [a]	1.358 [a]	1.506 [a]	1.448 [a]	1.421 [a]	1.425 [a]	1.420 [a]	1.988 [a]	1.988 [a]	2.056[a]	2.057 [a]
	(9.29)	(6.90)	(6.88)	(8.72)	(8.72)	(6.90)	(3.97)	(3.81)	(3.76)	(3.78)	(8.68)	(6.86)	(6.84)	(6.95)	(6.95)
CAPX/SALES	1.518 [a]	1.098 [a]	1.096 [a]	1.513 [a]	1.514 [a]	1.429 [a]	0.606	0.547	0.656	0.702	1.555 [a]	1.097 [a]	1.098 [a]	1.080 [a]	1.088 [a]
	(8.03)	(3.33)	(3.32)	(6.98)	(6.98)	(4.83)	(1.11)	(1.00)	(1.20)	(1.29)	(7.66)	(3.32)	(3.32)	(3.26)	(3.28)
LEVER	0.064	-0.006	0.014	-0.021	-0.038	0.053	0.184	0.588 [c]	0.187	-0.158	-0.012	-0.006	-0.008	-0.001	-0.095
	(0.98)	(-0.05)	(0.07)	(-0.28)	(-0.22)	(0.44)	(0.80)	(1.83)	(0.82)	(-0.50)	(-0.17)	(-0.05)	(-0.04)	(-0.01)	(-0.35)
STD_ROA(MONRET)		0.035	0.257	0.315 [c]	0.289		5.398 [b]	11.709[a]	-0.689 [b]	-1.414 [b]		-0.359	-0.379	0.207	0.057
		(0.02)	(0.10)	(1.65)	(0.96)		(2.09)	(2.67)	(-2.17)	(-2.55)		(-0.19)	(-0.15)	(0.70)	(0.12)
STD_ROA(MONRET)*LEVER			-1.127		0.101			-23.170[c]		2.418			0.105		0.568
			(-0.12)		(0.11)			(1.78)		(1.59)			(0.01)		(0.39)
LAMBDA											-0.017	-0.068[b]	-0.068[b]	-0.065[b]	-0.066[b]
											(-0.79)	(-2.10)	(-2.10)	(-1.99)	(-2.02)
N	2,451	811	811	1,916	1,916	2,451	811	811	811	811	2,196	795	795	795	795
R^2	0.109	0.121	0.121	0.117	0.117	0.798	0.845	0.846	0.846	0.846	0.020	0.021	0.021	0.022	0.022

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level.

Table 16
Regression Results for Change in Excess Value around Diversification

This table contains results from regressing change in excess value on various control variables. *EXVAL* is the natural logarithm of a firm's actual value to its imputed value. *NSEG* is the number of business segments a firm has, *LSIZE* is the natural log of total assets, *EBIT/SALES* is the ratio of EBIT to total sales, *CAPX/SALES* is the ratio of capital expenditures to total sales, *LEVER* is the ratio of interest bearing debt to total assets, *STD_ROA* is the standard deviation of return on assets, *STD_MONRET* is the standard deviation of monthly returns, and *RMSE* is the standard deviation of the residuals from the single factor market model based on weekly returns. Column 1 gives results using *STD_ROA* as the risk measure. Column 2 and column 3 use *STD_MONRET* or *RMSE* as the risk measure.

Variable	Risk Increase			Risk Decrease		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	-0.036	0.057	0.005	-0.126	-0.168[b]	-0.116
	(-0.25)	(0.82)	(0.07)	(-0.91)	(-2.17)	(-1.40)
LSIZE	-0.026	-0.025[b]	-0.020[c]	-0.020	0.016	0.018
	(-1.00)	(-1.99)	(-1.73)	(-0.78)	(1.16)	(1.22)
EBIT	0.215	0.218[c]	0.260[b]	0.348	0.045	-0.063
	(0.55)	(1.91)	(2.32)	(0.87)	(0.28)	(-0.38)
CAPX	-0.402	0.011	-0.053	1.063	-0.187[c]	-0.269
	(-1.56)	(0.10)	(-0.61)	(1.57)	(-1.76)	(-1.47)
LEVER	0.171	-0.002	0.038	0.258	0.088	0.013
	(0.75)	(-0.02)	(0.39)	(1.13)	(0.75)	(0.11)
N	178	615	634	174	470	451
R^2	0.027	0.011	0.012	0.027	0.011	0.007

a: Significant at 1% level. b: Significant at 5% level. c: Significant at 10% level.