A SIMULTANEOUS EXAMINATION OF TWO COMPETING EXPLANATIONS FOR THE CORPORATE DIVERSIFICATION DISCOUNT

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ABSTRACT

Inefficient internal capital markets and the coinsurance effect are two potential explanations for why firms with multiple business segments exhibit a value discount relative to single business segment firms. Previous research labels the difference in value a diversification discount and provides some support for both explanations. However, most studies examine the effects separately so it is difficult to determine their relative significance. We examine the two potential explanations simultaneously using fixed firm effect regressions. We use a measure of the diversity of a firm's investment opportunities to proxy for inefficient internal capital markets, and we use an interaction term involving leverage and risk to proxy for the coinsurance effect. Our results indicate a statistically significant negative relationship between firm value and the diversity in investment opportunities variable which indicates that inefficient internal capital markets are an important determinant of the diversification discount. The results suggest a negative relationship between firm value and the proxy for the coinsurance effect, but the relationship is not statistically significant in all tests.

INTRODUCTION

Most empirical studies conclude that, on average, corporate diversification is a value decreasing endeavor. Much effort has been devoted to explaining this diversification discount. Inefficient internal capital markets and the coinsurance effect are two widely discussed potential explanations. However, most studies examine the effects independently which makes it difficult to determine their relative significance. In this paper, we simultaneously examine the two effects. Our results indicate that inefficient internal capital markets has larger explanatory power than the coinsurance effect.

Lang and Stulz (1994) indicate that diversified firms are valued less than a comparable portfolio of single-segment firms since diversified firms exhibit lower Tobin's q than single-segment firms. Berger and Ofek (1995) report confirming results using an excess value methodology where excess value is calculated as the natural logarithm of a firm's actual value to its imputed value. They indicate that the value lost from diversification (or what is commonly called the diversification discount) ranges from 13% to 15% during the period 1986-1991. Other studies such as Servaes (1996) and Matsusaka and Wang (2014) report similar results. Along the same lines, studies such as Comment and Jarrell (1995) and Daley, Lane, Vikas, and Ranjini (1997) find an increase in firm value when firms refocus. Berger and Ofek (1999) interpret such

results as indicating that firms refocus to undo previous merger and diversification missteps. Numerous subsequent studies attempt to explain the diversification discount with inefficient internal capital markets and the coinsurance effect emerging as important potential explanations.

One vein of literature posits that the diversification discount is the result of inefficient internal capital markets. Scharfstein and Stein (2000) argue that misallocation of investments across divisions can arise from rent-seeking and bargaining between divisional managers and corporate headquarters. Xuan (2009) shows that CEOs allocate more capital to unconnected divisional managers in order to build rapport with them. Rajan, Servaes, and Zingales (2000) find that greater diversity in investment opportunities leads to less efficient investments and lower excess value for diversified firms. In their model, it is the diversity of investment opportunities among the divisions of a firm that drives inefficient allocations or cross-subsidization. More diverse investment opportunities across a firm's divisions result in larger distortions in the resource allocation process. Internal power struggles and bargaining lead to cross-subsidization of inefficient divisions which decreases firm value.

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 are conjectured to have lower firm risk than focused firms. This decreased firm risk combined with leverage could cause a wealth transfer from shareholders to bondholders through what is known as the coinsurance effect. Shareholders are worse off because they are the holders of a call option on the firm's assets. Call option pricing models, such as Black and Scholes (1973), indicate that decreasing the variance of the firm's cash flows lowers the value of the shareholders' call option position. Mansi and Reeb (2002) indicate that leverage plays an important role in explaining the diversification discount. They argue that no diversification discount exists when the market value of bonds is used to compute firm value. However Glaser and Mueller (2010) and Ammann, Hoechle, and Schmid (2012) find that the diversification discount remains significant after including an estimate of the market value of debt.

One problem with interpreting prior studies is that the two previously mentioned sources of the diversification discount are usually examined separately. It is quite likely, however, that the diversity in investment opportunities (a driving force of internal capital market inefficiency) is related to firm risk (a crucial condition for coinsurance effect) of diversified firms. For example, if there is larger diversity in investment opportunities, the cash flows of the segments are likely to be less correlated with each other resulting in lower variance of the firm's overall cash flows. Thus, empirical evidence construed as being consistent with one of the explanations could actually be consistent with the other explanation as well. Also, using leverage as a proxy for the coinsurance effect is problematic given the many ways that leverage can impact firm value.

To address this potential relationship, we account for inefficient internal capital markets and the coinsurance effect simultaneously to yield a better view of how important each is in determining the diversification discount. The results of our analysis contribute to the literature in three important ways. First, by examining these two important sources of the diversification discount simultaneously, the results provide a clearer picture of the relative significance of cross-subsidization across divisions and the transfer of wealth from shareholders to bondholders in

explaining the diversification discount. Second, by examining both sources simultaneously, we can determine if the combined effect of the two explanations fully account for the diversification discount. Third, we refine the proxy for the coinsurance effect to reflect debt and risk levels. Our results from controlling for both effects simultaneously indicate that diversity in investment opportunities which proxies for inefficient internal capital markets is more strongly related to excess value than the coinsurance effect proxy. We further find that excess value continues to be negatively related to the level of diversification after addressing both effects. These results imply that internal capital market inefficiency has larger explanatory power than the coinsurance effect, but that diversification destroys value in additional ways.

DATA AND DESCRIPTIVE STATISTICS

We gather data from the Compustat Industry Segment database for the period from 1984 to 2015. Following previous studies such as Berger and Ofek (1995), we exclude firm-year observations for firms with sales less than $20 million, for firms that do not report the value of total capital or four-digit SICs for all their segments, and for firms that have segments in the financial services industry (SIC 6000-6999). We also exclude firm year observations when the sum of segment sales of the firm is not within ninety-nine percent of the reported sales of the firm, when the sum of segment assets is not within seventy-five percent of the reported assets of the firm, and when firms do not have all the data available to compute market-to-book ratios. The original sample consists of a total of 84,160 firm-year observations.

We follow Berger and Ofek (1995) and compute excess value (EXVAL) as the logarithm of the ratio of a firm's actual value to its imputed value. Actual value is calculated as the market value of equity plus the book value of debt. Imputed value is set equal to the sum of the imputed stand-alone values for each business segment. To compute the imputed value of each business segment, we multiply the segment sales by the median market-to-sales ratio of all the single-segment firms that are in the same industry as that business segment. Note that the median excess value of single segment firms should be zero since the actual value is by definition the same as the imputed value. However, earlier studies have identified a diversification discount by showing that an increase in the number of business segments (NSEG) in a firm results in lower excess value, while a decrease in the number of business segments increases firm value (e.g., Berger and Ofek (1995), Lang and Stulz (1994), Comment and Jarrell (1995), John and Ofek (1995), Berger and Ofek (1999), and Matsusaka and Wang (2014)).

Previous studies have shown that the diversification discount remains significant after controlling for firm characteristics such as size, earnings, capital expenditures, research and development expenditures, and growth opportunities. However, since several of these variables have been shown to be significantly related to excess value, it is necessary to include them in our study. LSIZE is the natural logarithm of total assets. EBIT/SALES is the ratio of earnings before interest and taxes to sales. CAPX/SALES represents the capital expenditures to sales ratio. Growth opportunities are proxied by R&D/SALES which is research and development expenditures relative to sales, and TOBINQ which is Tobin's q. LEVER measures firm leverage

and is calculated as the ratio of interest bearing debt (the total of short-term and long-term debt) to total assets.

Table 1 displays descriptive statistics for excess value (EXVAL) and the control variables for the full sample. The sample consists of 84,160 firm year observations, 46,561 of which are from single segment firms and 37,599 from multi-segment firms. Consistent with previous studies such as Berger and Ofek (1995), we find that diversified firms have significantly lower excess value, larger size, higher profitability ratios, lower relative capital expenditures, lower Tobin's q, and higher leverage than single segment firms.

The mean (median) excess value for multiple segment firms is -8.1% (-8.7%), which is similar to the findings of Berger and Ofek (1995) who report mean (median) excess value of -9.7% (-10.6%). The median excess value for single segment firms is zero as expected. Also, consistent with Berger and Ofek (1995), the median multiple segment firm is about three times the size of the median single segment firm in terms of assets. Multiple segment firms exhibit significantly larger EBIT/SALES, but have lower average CAPX/SALES, R&D/SALES, and TOBINQ than single segment firms. The mean and median leverage ratio of multiple segment firms is higher than those of single segment firms, which confirms the findings of other studies that diversified firms borrow more than focused firms. Correlations for EXVAL, NSEG, and the control variables are not shown since they are very similar to the values shown in previous studies.

Table 1
Summary Statistics

Variable	*Multi-Segment (N=37,599)*			*Single Segment (N=46,561)*			*Difference (Multi – Single)*	
	Mean	*Median*	*Std. Dev.*	*Mean*	*Median*	*Std. Dev.*	*T-Stat*	*Z-Stat*
EXVAL	-0.081	-0.087	0.605	-0.008	0.000	0.591	-18.72[a]	-22.62[a]
NSEG	2.999	3.000	1.252	1.000	1.000	0.000	309.58[a]	313.37[a]
ASSETS	2874.230	376.426	10436.830	855.920	128.252	3705.690	36.11[a]	66.07[a]
EBIT/SALES	0.067	0.073	0.120	0.050	0.066	0.169	17.49[a]	12.36[a]
CAPX/SALES	0.064	0.037	0.104	0.082	0.037	0.150	-22.59[a]	-2.69[a]
R&D/SALES	0.028	0.004	0.058	0.049	0.000	0.095	-43.01[a]	27.49[a]
TOBINQ	1.241	0.991	0.838	1.545	1.163	1.149	-47.81[a]	-34.66[a]
LEVER	0.250	0.233	0.187	0.228	0.185	0.216	17.47[a]	29.14[a]

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

METHODOLOGY

The main focus of this paper is to examine inefficient capital markets and the coinsurance effect as potential explanations for the diversification discount. In previous studies, their effects have usually been examined separately, so the relationship of the two potential explanations and

their relative importance is missed. In this study, we address the two effects simultaneously in order to get a better idea of how important each is in determining the diversification discount.

As is prevalent in previous research in the area, we use regression analysis to examine the relationship of excess value to various firm characteristics. Since firms choose to diversify or remain focused and choose the level of many of the examined firm characteristics, it is necessary to control for selection bias. Following Rajan, Servaes, and Zingales (2000), Campa and Kedia (2002), and Villalonga (2004), we use fixed firm effect estimation to control for the selection bias assuming that the unobserved heterogeneity that causes the correlation between the error terms is constant over time. Based on previous research, all previously discussed variables are included in the analysis. NSEG is the number of business segments for the firm and its coefficient reflects the diversification discount not explained by the other included variables. LSIZE, EBIT/SALES, CAPX/SALES, R&D/SALES, TOBINQ, and LEVER are included as control variables.

Inefficient Capital Markets

We include diversity in investment opportunities (DIVERSITY) to measure the impact of inefficient internal capital markets. Following Burch and Nanda (2003), we compute the measure of diversity in investment opportunities as the asset-weighted standard deviation of equally weighted segment Tobin's q's:

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

In the above formula, w_j is the asset weight of segment j, q_j is the Tobin's q for the industry for that segment, and n is the total number of segments for the firm. We use the industry median market to book value of assets of all the single segment firms that share the same SIC code with the segment to proxy for the segment Q. Industry medians are calculated based on the narrowest SIC grouping that includes at least five single segment firms. We follow Campa and Kedia (2002) to compute the market value of the firm as the market value of equity, plus the book value of short-term debt, long-term debt, and preferred stock.

Coinsurance Effect

As previously mentioned, we include LEVER in our analysis based on the findings of Mansi and Reeb (2002) who indicate that leverage plays an important role in explaining excess value and the diversification discount. Unlike Mansi and Reeb (2002), we do not consider leverage alone to be a good proxy for the coinsurance effect. The coinsurance effect is based on viewing equity as a call option with the value of debt as the option's strike price. Option pricing models indicate that decreasing firm risk will decrease the value of the equity position resulting in a wealth transfer from stockholders to bondholders which is commonly referred to as the coinsurance effect. However, using leverage alone as a proxy for the coinsurance effect has two major issues.

First, it is important to recognize that leverage can affect firm value in several ways, so we cannot attribute all its effect on firm value to the coinsurance effect. For example, higher

leverage can benefit a firm by increasing interest tax shields, and leverage may act as an effective bonding device for management which could lower agency costs and improve performance. For example, Li and Li (1996) find that *keiretsu* (enterprise group, a prominent industrial structure in Japan) have higher leverage and better performance than non-group firms. They further argue that the lower performance of the U.S. conglomerate merger wave in the 1960s is due to these firms' lower leverage. On the other hand, leverage may have a detrimental impact on firm value due to higher expected bankruptcy costs.

Second, there is no guarantee that increasing the number of business segments leads to lower firm risk. In some cases, firms may enter closely related business segments that yield no diversification effect, or firms may add more risky business segments which could actually increase risk. Further, other authors postulate that diversified firms may undertake activities to address risk changes. Arnold, Hackbarth and Puhan (2015) show that asset sales increase the riskiness of debt which can mitigate the wealth transfer from shareholders to bondholders due to inefficient investments.

The key takeaway is that the coinsurance effect requires both financial leverage and a change in risk for it to impact shareholder value. Therefore, we add proxies for firm risk (RISK) to fine tune our proxy for the coinsurance effect. Having both leverage and risk measures in our analysis allows us to include an interaction term between the two variables (LEVER*RISK). Since LEVER*RISK captures both the debt and risk levels of the firms, it is a more refined proxy for the coinsurance effect. LEVER and RISK individually capture the net impact of other value impacts of leverage and risk, respectively.

Since previous studies use two main types of risk measures, we include both types of measures in this paper. The first risk measure uses accounting data to calculate the variability of returns and cash flows (e.g., Kini, Kracaw, and Mian (2004)). It is calculated as the standard deviation of operating income before depreciation divided by total assets. We compute the risk measure for the single segment firms and the multiple segment firms separately. For single segment firms (multiple segment firms), we require the firm to stay focused (diversified) for the current year and the next two years. Additionally, we require the firms to have data available to compute the measure for at least ten quarters in these three years. The second risk measure uses price data to calculate the variability of stock market returns. It is calculated as the standard deviation of monthly stock returns. Monthly returns are collected from the CRSP database.

The correlations for NSEG, DIVERSITY, and the two risk measures are shown in Table 2. As shown in prior studies, DIVERSITY is significantly negatively correlated with NSEG. Both risk measures are also significantly negatively correlated with NSEG which suggests that, on average, firms with more business segments exhibit lower risk. Both risk measures exhibit positive correlation coefficients relative to DIVERSITY. However, the correlation coefficient is only statistically significant for the RISKROA. As expected, the two risk measures exhibit a statistically significant positive correlation, but the correlation coefficient is slightly less than 0.30.

Table 2
Correlation Matrix: Number of Segments, Risk Measures, and Diversity Measure

Variables	NSEG	DIVERSITY	RISKROA	RISKRET
NSEG	1			
	37599			
DIVERSITY	-0.07954	1		
	<.00001			
	25395	25395		
RISKROA	-0.09251	0.03128	1	
	<0.0001	<0.0001		
	24690	16736	24960	
RISKRET	-0.11745	0.00791	0.29836	1
	<0.0001	0.2815	<0.0001	
	27118	18539	24690	27118

Model and Hypotheses

We estimate various versions of the full regression shown in Equation (2). We first estimate regressions that do not include DIVERSITY and RISK measures to allow comparison to previous studies. We then estimate several versions of the regressions that include DIVERSITY, RISK, and LEVER*RISK.

$$\text{EXVAL} = \beta_0 + \beta_1(\text{NSEG}) + \beta_2(\text{LSIZE}) + \beta_3(\text{EBIT/SALES}) + \beta_4(\text{CAPX/SALES}) + \beta_5(\text{R\&D/SALES}) + \beta_6(\text{TOBINQ}) + \beta_7(\text{LEVER}) + \beta_8(\text{DIVERSITY}) + \beta_9(\text{RISK}) + \beta_{10}(\text{RISK*LEVER}) + \varepsilon \quad (2)$$

Since our main concern is how internal capital market inefficiency and the coinsurance effect each contributes to the lower excess value of diversified firms, DIVERSITY, which is the previously described measure of diversity in investment opportunities, and RISK*LEVER, which is the interaction between leverage and firm risk, are the variables of most concern in this study. DIVERSITY should exhibit a negative relationship with EXVAL if inefficient internal capital markets are a determinant of the diversification discount. Likewise, RISK*LEVER should exhibit a negative relationship with EXVAL if diversification leads to a wealth transfer from stockholders to bondholders as suggested by the coinsurance effect. The relative importance of each variable should be apparent when the two are included together in the regressions.

Of course, it is also important to pay attention to the significance of the coefficient for NSEG (the number of business segments). If the coefficient for NSEG remains negative and statistically significant after including all variables, it follows that diversification lowers firm value through ways not addressed in this study. If the coefficient for NSEG becomes

insignificant, it would suggest that the diversification discount is fully explained by the studied variables. If the coefficient for NSEG becomes positive and statistically significant when all variables are included, it would indicate that diversification creates value after considering the impact of studied variables.

RESULTS

Table 3
Fixed Effects Regression Results – Control Variables

Variable	*Regression*	
	(1)	(2)
INTERCEPT	-0.879[b]	-1.750[a]
	(-2.16)	(-4.95)
NSEG	-0.020[a]	-0.015[a]
	(-6.68)	(-5.93)
LSIZE	0.101[a]	0.149[a]
	(19.19)	(32.39)
EBIT/SALES	0.677[a]	0.016
	(22.23)	(0.55)
CAPX/SALES	0.765[a]	0.639[a]
	(17.43)	(16.69)
R&D/SALES		1.027[a]
		(10.23)
TOBINQ		0.381[a]
		(100.07)
LEVER	0.125[a]	0.237[a]
	(5.94)	(12.86)
N	37,324	37,324
Adj. R^2	0.622	0.714

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

Table 3 displays fixed effect regression results for the sample of all diversified firms where NSEG, which indicates that the relationship of EXVAL to the number of business segments, and various control variables are included. To allow comparison to previous studies, two regressions are run. The first regression excludes R&D/SALES and TOBINQ since they were not included in the earliest studies in the area. The second regression includes all of the control variables. Diversity in investment opportunities measures and risk measures are added in later regressions.

The results for Regressions (1) and (2) show that excess firm value is negatively related to NSEG which confirms that excess value becomes more negative as the number of business

segments increases. In Regression (1), excess value is significantly positively related to LSIZE, EBIT/SALES, CAPX/SALES, and LEVER. Regression 2 adds research and development to sales and Tobin's q to the regression. Both R&D/SALES and TOBINQ are positively related to excess value for diversified firms. The inclusion of the two new variables that control for the firms' growth opportunities causes the coefficient for the profitability measure (EBIT/SALES) to become statistically insignificant. This implies that profitability may have been a proxy for the impact of growth opportunities on excess value. The inclusion of the growth opportunity proxies does not materially affect the coefficients and statistical significance of the other variables. Overall, the results are consistent with the findings of previous studies.

Table 4
Fixed Effects Regression Results – Risk: Standard Deviation of Return on Assets

Variable	*Regression*		
	(3)	(4)	(5)
INTERCEPT	-1.136[a]	-3.375[a]	-3.382[a]
	(-3.40)	(-10.11)	(-10.13)
NSEG	-0.013[a]	-0.012[a]	-0.012[a]
	(-4.03)	(-2.90)	(-2.90)
LSIZE	0.150[a]	0.155[a]	0.155[a]
	(26.61)	(20.93)	(20.89)
EBIT/SALES	-0.029	-0.101[b]	-0.105[b]
	(-0.76)	(-2.07)	(-2.14)
CAPX/SALES	0.609[a]	0.663[a]	0.664[a]
	(13.54)	(11.51)	(11.53)
R&D/SALES	1.122[a]	1.220[a]	1.217[a]
	(7.34)	(5.92)	(5.90)
TOBINQ	0.453[a]	0.454[a]	0.454[a]
	(84.55)	(68.91)	(68.91)
LEVER	0.289[a]	0.299[a]	0.324[a]
	(13.07)	(9.97)	(8.33)
DIVERSITY	-0.283[a]	-0.284[a]	-0.284[a]
	(-13.36)	(-10.95)	(-10.95)
RISKROA		-1.591[a]	-1.192[b]
		(-4.81)	(-2.33)
LEVER*RISKROA			-1.550
			(-1.02)
N	25,201	16,600	16,600
Adj. R^2	0.743	0.750	0.750

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

Tables 4 and 5 contain fixed effects regression results with diversity and risk measures included. In Table 4, the risk measure is calculated as the standard deviation of return on assets (RISKROA). Regression (3) adds the diversity measure to address the impact of potentially inefficient internal capital markets. Regression (4) adds the risk measure, and Regression (5) inserts the interactive term of the risk measure and leverage (LEVER*RISKROA) to capture the coinsurance effect. In the control regressions, the coefficient for the number of segments is negative and significantly associated with excess value. The coefficient for NSEG remains negative and significant after the inclusion of the diversity and risk measures, although the coefficient is smaller. This implies that the level of diversification affects firm value through ways other than the inefficient internal capital market and the coinsurance effect. In all regressions, leverage is positively related to excess value, which is consistent with the tax benefit of leverage, the signaling effect of debt, and the disciplining effect of debt.

Table 5
Fixed Effects Regression Results – Risk: Standard Deviation of Monthly Returns

Variable	*Regression*		
	(3)	(6)	(7)
INTERCEPT	-1.136[a]	-3.317[a]	-3.295[a]
	(-3.40)	(-9.98)	(-9.91)
NSEG	-0.013[a]	-0.009[a]	-0.008[a]
	(-4.03)	(-2.30)	(-2.25)
LSIZE	0.150[a]	0.147[a]	0.148[a]
	(26.61)	(21.29)	(21.34)
EBIT/SALES	-0.029	-0.049	-0.045
	(-0.76)	(-1.04)	(-0.95)
CAPX/SALES	0.609[a]	0.671[a]	0.673[a]
	(13.54)	(11.96)	(11.99)
R&D/SALES	1.122[a]	1.101[a]	1.107[a]
	(7.34)	(5.57)	(5.60)
TOBINQ	0.453[a]	0.450[a]	0.450[a]
	(84.55)	(71.81)	(71.85)
LEVER	0.289[a]	0.334[a]	0.258[a]
	(13.07)	(11.63)	(5.51)
DIVERSITY	-0.283[a]	-0.300[a]	-0.299[a]
	(-13.36)	(-12.13)	(-12.13)
RISKRET		-0.248[a]	-0.416[a]
		(-3.66)	(-3.90)
LEVER*RISKRET			-0.566[b]
			(-2.04)
N	25,201	16,600	16,600
Adj. R^2	0.743	0.747	0.747

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

The diversity measure is negative and significantly related to excess value in all regressions in which DIVERSITY is included. Further, there is effectively no change in its coefficient or its significance after the interactive term is included. This indicates that excess value is negatively impacted as diversity in investment opportunities increases. Firm risk is also negatively related to excess value. This result may be attributable to the fact that investors require a higher return for more risky firms, which may lead to a lower firm value. The significance of the risk measure decreases after the inclusion of its interactive term with leverage, but it remains statistically significant. The coefficient for the interactive term of firm risk and leverage (LEVER*RISKROA) is negative as expected, but it is statistically insignificant. This means that these results cannot confirm that the coinsurance effect has a substantial impact on firm's excess value.

Table 5 contains fixed effects regression results with the diversity measure and the risk measure calculated as the standard deviation of monthly stock returns (RISKRET). Regression (3) is repeated from Table 4 for ease of comparison. Regression (6) adds the risk measure calculated as the standard deviation of monthly stock returns, and Regression (7) includes the interactive term of the risk measure and leverage (LEVER*RISKRET) to capture the coinsurance effect. Similar to the results shown previously, in Table 5 the coefficient for the number of segments remains negative and significantly associated with excess value after inclusion of the diversity and risk proxies. This again implies that the level of diversification affects firm value through ways other than the inefficient internal capital market and the coinsurance effect. In all regressions, leverage is positively related to excess value, which is consistent with the tax benefit of leverage, the signaling effect of debt, and the disciplining effect of debt.

DIVERSITY is negative and significantly related to excess value in all regressions in which it is included. Similar to previous results, there is little change in the coefficient or its significance after the interactive term is included. These results confirm that excess value is negatively related to diversity in investment opportunities. As in the previous regressions, firm risk is negatively related to excess value. The significance of the risk measure remains stable after the inclusion of its interactive term with leverage. Unlike the result in the previous table, the coefficient for the interactive term of firm risk and leverage (LEVER*RISK) is negative and significant at the 5% level. This result suggest that the coinsurance effect does have an impact on firm's excess value. However, the coinsurance effect does not seem to be as strong as the effect of the diversity of investment opportunities which proxies for internal capital market inefficiency.

CONCLUSIONS

The existing literature suggests that the diversification discount is related to internal capital market inefficiency as well as the coinsurance effect. The internal capital market inefficiency is expected to affect firm value through power struggle and rent seeking. The coinsurance effect is an expected wealth transfer from shareholders to bondholders that results from leverage and lower firm risk due to diversification across business segments. We find that

diversity in investment opportunities exhibits a statistically significant negative relationship to firm value. An interactive term involving firm risk and leverage is statistically significant at a lower confidence level in only one test. We interpret these results to indicate that internal capital market inefficiency is more important in determining the excess value of diversified firms than the coinsurance effect. We further find that the number of business segments remains significantly negatively related to firm excess value, which implies that the level of diversification lowers firm value through ways other than inefficient capital markets or the coinsurance effect.

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