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Capital Market Conditions and the Value of Corporate Diversification for Japanese Firms[1]

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Abstract

This study investigates the value of corporate diversification in Japanese firms with particular attention to its dynamics. Our analysis, based on a panel of listed nonfinancial firms, indicates that the value of diversification increases substantially when external capital is costlier or more difficult to access. Moreover, this tendency is more pronounced for firms in which divisional cash flows are less positively correlated. This pattern implies that coinsurance is instrumental to the observed association between the value of diversification and capital market conditions. We also find that this association is stronger for firms with higher bankruptcy risk, which is consistent with the notion that the financing advantages of diversified firms improve their ability to fulfill contractual obligations. These results suggest that the value of corporate diversification fluctuates because macroeconomic shocks change the relative value of the internal and external capital markets.

Keywords: corporate diversification, internal capital market, coinsurance, bankruptcy risk
JEL classification: G32, L25

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1. Introduction

Following the seminal works of Lang and Stulz (1994) and Berger and Ofek (1995), research has produced a large body of evidence that U.S. firms diversified across industries trade at a discount relative to firms specializing in a single industry. This phenomenon, known as diversification (conglomerate) discount, has been hotly debated in finance. Early studies posit that the discount is a consequence of inefficient management such as empire building and socialistic resource allocation (Denis *et al.* 1997; Shin & Stulz 1998; Rajan *et al.* 2000; Scharfstein & Stein 2000; Ozbas & Scharfstein 2009). However, later studies question this view by showing that the discount disappears or even turns into a premium when the endogeneity of firm scope is accounted for (Campa & Kedia 2002; Villalonga 2004). Theoretical studies also suggest that a diversification discount can arise when firms set their industrial scope optimally (Matsusaka 2001; Gomes & Livdan 2004).

Recent research provides fresh insights into this controversial issue by showing that the relative value of diversified firms vis-à-vis focused firms varies systematically with macroeconomic conditions. Specifically, the discount for diversified firms diminishes when external financing is costlier or more difficult to access (Yan 2006; Matvos & Seru 2014; Kuppuswamy & Villalonga 2016; Boguth *et al.* 2022). This pattern suggests that internal capital markets, through which diversified firms reallocate funds across divisions to fulfill their contractual obligations and investment needs, become more valuable when frictions in external capital markets are more serious. The diversification discount varies across time because depending on capital market conditions, the financial benefit of diversification is valued differently by investors. This interpretation implies that, notwithstanding possible biases and measurement errors, the relative value of diversified and focused firms contains useful information on the value of corporate diversification.

Against this background, this study presents new evidence on the dynamics of the value of diversified firms, focusing on the case of Japanese firms. If diversified firms' divisions are organized as standalone entities, they must obtain capital from outside investors when they lack sufficient funds

for growth or even survival. Accordingly, internal capital markets are an organizational alternative to external capital markets, as stressed by Gertner *et al.* (1994) and Stein (1997). In this regard, the dynamics documented by the above studies for U.S. firms are consistent with the theorem that the value of organizations depends on what markets can do, as well as what they can do (Coase 1937; Williamson 1975). Given the fundamentality of this theorem for our understanding of the existence and scope of the firm, it is natural to anticipate that similar dynamics are also present in other economies. Checking the external validity of US-based evidence is, therefore, crucial for verifying how and why the relative value of diversified firms fluctuates. However, to the best of our knowledge, there is little international evidence regarding this issue.

Studying Japan can contribute significantly to filling this gap. Cross-country studies indicate that Japan is second only to the U.S. as the domicile of listed conglomerates (Rudolph & Schwetzler 2013; Kuppuswamy *et al.* 2014). Diversified firms in Japan also have large domestic presence. In our sample of listed firms, diversified (multi-segment) firms' shares of assets and market value are 78% and 69%, respectively. Moreover, Japan has large, developed capital markets, which differ from US markets in important respects. In particular, Japan is a more bank-centered economy with asset-based lending practices, as opposed to the cash flow-based lending practices popular in the US (Ito & Hoshi 2020; Lian & Ma 2020). Japan's capital markets also experienced unique dynamics due to idiosyncratic shocks, such as the large domestic banking crisis after the collapse of the bubble economy and the highly expansionary monetary policies adopted by the Bank of Japan (BOJ) in the 2010s. Therefore, to study the influence of capital market conditions on the value of diversified firms, Japan is a well-differentiated, excellent alternative to the US.

Our sample comprises a panel of nonfinancial firms listed between 2000 and 2019. Following Berger and Ofek (1995), we measure the value of diversification as the excess value of multi-segment firms vis-à-vis single segment firms. Based on this standard metric, we first show that the estimated value of diversification is negative, on average, for Japanese firms during the study period. A significant

discount for diversified firms is observed, even when firm-fixed effects are included in the regressions to account for unobserved heterogeneity. However, when estimated annually, the value of diversification shows significant intertemporal variation. For instance, the difference in the mean sales-based excess values of diversified and focused firms ranges from -21.4% to +4.8% during the study period. Regression-based estimates also fluctuate substantially over time.

We investigate the sources of this variation by estimating the association between diversified firms' excess value and macroeconomic factors such as the average lending rate of banks and corporate bond spreads. We find that the value of diversified firms is strongly contingent on the economy-wide conditions of corporate finance; diversified firms are valued relatively highly when external capital is costlier or more difficult to access. Our baseline regression indicates that in the average state during the study period, a one standard deviation (SD) increase in capital market adversity, measured by a synthetic index of eight macroeconomic variables, reduces the average discount for diversified firms from 8.3% to 2.8%. Therefore, as documented by US studies, capital market conditions significantly affect the relative value of diversified firms.

Given this finding, we examine why diversified firms are valued relatively highly when external finance conditions deteriorate. This pattern does not necessarily emanate from diversification per se because industrial scope is not the only difference between diversified and focused firms. For instance, diversified firms are typically larger and older than focused firms. They also tend to have more established relationships with their capital providers. Because these features improve a firm's access to external funds (Hadlock & Pierce 2010), diversified firms can be insulated from capital market shocks even if they are focused on a single industry. To consider this possibility, we estimate regressions including the time-varying effects of firm size, age, and main bank relationship. We find that the value of these factors increases when the capital market conditions deteriorate. However, even when these effects are considered, the association between the relative value of diversified firms and capital market adversity is significantly positive. Hence, the industrial scope of diversified firms plays a central role

in the observed dynamics of their value.

Why does diversification become more valuable under stressed capital market conditions? A leading hypothesis offered by previous studies is that coinsurance, rooted in the imperfect correlation of divisional cash flows, becomes more valuable when external capital is in short supply (Matvos & Seru 2014; Kuppuswamy & Villalonga 2016; Matvos *et al.* 2018; Boguth *et al.* 2022). This scenario implies that the effect of capital market conditions is particularly large when a firm's divisions have heterogeneous cash flow fluctuation patterns and thus a stronger ability to cross-subsidize.[1] We test this prediction, which remains untested in the literature, using the coinsurance measure developed by Duchin (2010) and Tong (2012). Consistent with this prediction, we find that the excess value of diversified firms increases more with capital market adversity when the cash flows of their divisions are less positively correlated. This pattern lends strong credence to the view that the relative value of diversified firms increases under worse capital market conditions because internal capital markets insulate them from capital market shocks.

Coinsurance reduces diversified firms' risk of defaulting on contractual obligations (Lewellen 1971; Hann *et al.* 2013). It also mitigates underinvestment risk by alleviating divisional financial constraints (Duchin 2010). Accordingly, the influence of capital market conditions on the value of diversified firms can differ depending on their exposure to these risks. To consider this possibility, we examine how the effect of capital market adversity on diversified firms' excess value is moderated by the Altman Z-score, an inverse measure of bankruptcy risk, and the intensity of investments in tangible and intangible assets. We find that the value of diversified firms increases with capital market adversity, particularly when their bankruptcy risk is high. By contrast, we do not observe a significant moderating effect of investment intensity. This difference suggests that the value of diversified firms increases with worsening external finance conditions, mainly because diversification insulates a firm's contractual

[1] Matvos and Seru (2014) provide simulation-based evidence that coinsurance is instrumental in increasing the value of diversified firms during periods of financial market stress.

relationships with its stakeholders from capital market shocks.

Overall, the present study demonstrates that the relative value of diversified firms in Japan increases when capital market conditions deteriorate. This tendency is particularly salient when firms have a high ability to cross-subsidize divisions because of the weak correlations in divisional cash flows. This tendency is also pronounced for firms whose ability to fulfill contractual obligations can be severely impaired when external capital is in short supply. These results lend strong credence to the view that the observed dynamics in the relative value of diversified firms vis-à-vis focused firms reflect changes in the relative value of internal and external capital markets.

The remainder of this paper is organized as follows. The next section introduces the sample and data and documents the excess value of diversified firms over the study period. Section 3 investigates the intertemporal variation in the relative value of diversified firms and its association with capital market conditions. Section 4 investigates the moderating factors of observed dynamics. The final section presents the conclusions of this study.

2. Data

2.1. Sample

Our sample is based on all non-financial firms listed on Japanese stock exchanges between 2000 and 2019. To measure the industrial scope of these firms, we obtain industry segment data from the Nikkei NEEDS financial database. Nikkei assigns up to three Japan Standard Industry Classification (JSIC) codes to each segment.[2] When a segment has multiple JSIC codes, we define the industry based on its primary code. We define a firm as diversified if it operates multiple segments that are distinct at the JSIC 4-digit level. We exclude firms with a financial segment (JSIC 6111-6759) or an unclassifiable

[2] Nikkei defines the industry of a segment based on JSIC Revision11 for the fiscal years ending before June 2014 and JSIC Revision 13 for later periods. To ensure the consistency of industrial classification over the study period, we converted Revision 13 codes to Revision 11 codes using the correspondence tables provided by the Ministry of Internal Affairs and Communications.

segment (JSIC 9999) and firms with irregular reporting, such as negative equity and accounting period less than twelve months. We also exclude firms when the sum of segmental sales (assets) deviates from firm sales (assets) by 5% (25%) or more. When the magnitude of deviation is less than this cutoff level, we adjust the value of each segment by the same percentage such that the sum of the segmental values matches the value of the entire firm.

Our main variable is the excess value of Berger and Ofek (1995). When based on segmental sales, the excess value (EV_{it}) is defined as the logged ratio of firm value (M_{it}), defined as the market value of equity plus debt, to the sum of the imputed value of segments, which is estimated as segmental sales (ss_{ijt}) times the median sales multiple (m_{jt}) of focused (single-segment) firms in the same industry. That is,

$$EV_{it} = ln\left(M_{it} \Big/ \sum_j ss_{ijt} \cdot m_{jt}\right) \qquad (1)$$

The asset-based excess value is defined similarly using segmental assets instead of sales. To match segments to an industry, we require that the industry has at least five focused firms. If this condition is not satisfied at the 4-digit level, matching is made at the finest JSIC level, at which at least five focused firms exist. For sales- (asset-) based excess value, our final sample includes 60,867 (53,240) firm-years, of which 30,241 (22,592) are diversified observations.

2.2. Diversification discount

First, we demonstrate that a valuation pattern well documented for U.S. firms exists in Japan.[3] Table 1 reports the descriptive statistics of excess values separately tabulated for diversified and focused

[3] Existing evidence on the value of diversification for Japanese firms is limited compared with the large body of evidence for U.S. firms. See Lins and Servaes (1999) and Ushijima (2016) for earlier studies of the value of diversification in Japan. Rudolph and Schwetzler (2013) showed that the value of diversification increases in the Asia-Pacific region including Japan during the global financial crisis.

firms. As shown in the upper panel, there is a significant difference in the mean sales-based excess value. Our data indicate that on average, diversified firms are discounted by 10% points vis-à-vis focused firms over the sample period. The difference in the median is smaller but also indicates a discount for diversified firms. The lower panel, comparing asset-based excess values, shows similar differences. Therefore, diversified firms in Japan tend to be valued lower than focused firms.

To estimate the difference conditioned on the other determinants of firm value, we perform a regression analysis based on the following model:

$$EV_{it} = \alpha + \beta \cdot D_{it} + \gamma \cdot z_{it} + \varphi_t\ (+\theta_i) + \epsilon_{it}, \qquad (2)$$

where D is a dummy variable for diversified firms, z is a vector of control variables, and φ is the year-fixed effect. The control variables consist of firm size (logged assets), profitability (EBITDA/sales), investment (CAPEX/sales), leverage (debt/market equity), R&D intensity (R&D expenses/sales), and marketing intensity (advertising and sales promotion expenses/sales). We perform estimations with and without firm-fixed effects (θ). Table 2 presents the descriptive statistics of these regression variables. All non-dummy variables are winsorized at the top and bottom 1%.

Table 3 shows regression results. Column (1) reports the results of the ordinary least squares (OLS) regression of sales-based excess value. The coefficient of the diversification dummy is negative and significantly different from zero. The estimated coefficient implies that when other factors affecting firm value are held constant, diversified firms are valued lower than focused firms by 8.3% points on average. Column (2) presents the results of the Fama-MacBeth estimation based on annual cross-sectional regressions. The estimated coefficients are highly similar to those of the OLS regression. Column (3) shows the results of the regression including firm-fixed effects. The estimated coefficient of the diversification dummy is negative and highly significant, even when unobserved firm

heterogeneity is accounted for. Columns (4)–(6) show the regression results for the asset-based excess value. The relatively low value of diversified firms is also evident in these results.

2.3. Intertemporal variations

The regression results reported in the preceding section indicate a significant discount for diversified firms. However, these regressions can conceal a large intertemporal variation, as they are performed over a twenty-year period. To gain preliminary insight into this issue, Table 4 tabulates the yearly differences (diversified firms minus focused firms) in mean and median sales-based excess values. The figures show large intertemporal variations. In particular, while the difference in mean is positive for the early 2000s when Japan was in a serious banking crisis, it is deeply negative for the late 2010s when the Bank of Japan adopted a negative interest rate policy to stimulate bank lending.

Table 4 also shows the coefficients of the diversification dummy estimated by annual cross-sectional regressions, which were performed to obtain the Fama-MacBeth estimation results presented in Column (2) of Table 3. Unlike simple differences, these regression-based estimates of the value of diversification are negative throughout the study period. However, the estimated coefficient is not significantly different from zero for the early 2000s, whereas it is negative and highly significant for the late 2010s. Therefore, the relative value of diversified firms vis-a-vis focused firms fluctuates significantly over time. Furthermore, the observed fluctuation pattern suggests that diversified firms are valued relatively highly when capital market conditions deteriorate.

3. Influence of capital markets

3.1. Macroeconomic variables

We use eight macroeconomic variables to consider the influence of capital market conditions on the observed changes in the relative value of diversified firms. As a measure of the cost of debt, we

use the average lending interest rate of banks (lending rate) and the average T-spread of corporate bonds (bond spread). To measure banks' willingness to extend credit to corporate borrowers, we use Bank of Japan's index of financial institutions' lending attitude (lending attitude). In addition, we use the average monthly return on bank stocks (bank returns) as a surrogate for banking sector shocks and the number of corporate bankruptcy (firm failures) as a measure of banks' credit risk. To capture the conditions for equity finance, we use the average market-to-book ratio of non-financial firms (M/B ratio). Finally, as a measure of general economic conditions, we use the unemployment rate (jobless rate) and the real GDP growth rate (GDP growth). Except for bond spread, which lacks data for the initial two years, these variables are available for the entire study period.

Table 5 presents the descriptive statistics of these variables and their correlations with the estimated value of diversification. Overall, the reported correlation coefficients indicate that the value of diversification tends to increase when external financing is costlier or more difficult to access. Figure 1 illustrates this tendency based on scatter plots drawn for each macroeconomic variable. As shown in Panel (a), the estimated value of diversification tends to be larger when banks' lending rates are higher, whereas Panel (c) indicates the opposite relationship for banks' lending attitudes. Diversified firms are also valued relatively highly when banks' credit risk, measured by firm failures, is high and when the M/B ratio is low, as shown in Panels (f) and (e), respectively. These correlations are likely to contain common information. Thus, we perform a principal component analysis on the eight variables and use their first principal component as a synthetic measure of capital market conditions.[4] This variable has positive loadings with variables increasing with the cost and difficulty of external finance, such as the lending rate and firm failures, and negative loadings with variables associated with favorable financing conditions, such as lending attitude and M/B ratio. Hence, we name this synthetic variable capital

[4] As noted earlier, data for bond spread are missing for 2000 and 2001. To estimate bond spread for these years, we extrapolate it based on its regression on other seven macroeconomic variables estimated for 2002 to 2019. Our principal component analysis is performed on data supplemented by these estimates.

market adversity. Panel (i) shows that capital market adversity is positively correlated with the estimated value of diversification.

3.2. Regressions

To verify the patterns documented above, we estimate regressions including the interaction term between the diversification dummy and a macroeconomic variable (m). That is,

$$EV_{it} = \alpha + \beta_0 D_{it} + \beta_1 D_{it}(m_t - \bar{m}) + \gamma z_{it} + \varphi_t\ (+\theta_i) + \epsilon_{it}, \quad (3)$$

where $\bar{m}$ is the mean of m during the study period. Accordingly, the coefficient of the independent term of the diversification dummy represents the value of diversification in the average economic state during the sample period. The model does not include the independent term of m because it is absorbed by the year-fixed effect (φ), which comprehensively captures the influence of macroeconomic factors on all firms.

Table 6 reports the estimation results focusing on the coefficients associated with the value of diversification and their standard errors. Panel A shows the results of OLS estimation. Across the board, the coefficient of the interaction term between the diversification dummy and a macroeconomic variable is significantly different from zero. The estimated interaction effect is positive for variables negatively associated with external finance conditions, such as the lending rate and bond spread, and negative for variables with the opposite association, such as lending attitude and M/B ratio. Consistent with these patterns for individual macroeconomic variables, Column (9) indicates that the interaction effect between capital market adversity and the diversification dummy is significantly positive. Therefore, the relative value of diversified firms increases when external capital is costlier or more difficult to obtain. The estimated coefficients in Column (9) imply that in the average state during our study period, one SD increase in capital market adversity reduces the average discount for diversified firms from 8.3% to

2.8%. Capital market conditions therefore exert an economically significant effect on the relative value of diversified firms.

One concern about these results is that they can be driven by changes in the extensive margin of diversified firms. If improved (deteriorated) access to external capital induces low-value firms to become (cease) diversified, the average value of diversified firms can decrease (increase) under favorable (unfavorable) capital market conditions because of the entry (exit) of these firms. We consider this possibility by confining the estimation sample to firms that remained focused or diversified throughout the study period. The extensive margin of diversified firms is therefore fixed in these regressions. As reported in Panel B, the estimated interaction effect retains the same sign as in Panel A and is highly significant, except for GDP growth. The regressions in Panel C include firm-fixed effects. The results of these longitudinal estimations also indicate that the relative value of diversified firms is strongly contingent on capital market conditions.

3.3. Confounding factors

The observed changes in the value of diversified firms do not necessarily emanate from diversification per se because diversified and focused firms do not differ only in their industrial scope. In particular, diversified firms tend to be larger and older than focused firms. In our sample, the mean total assets (billion yen) of diversified firms is 257, whereas that of focused firms is 71.The mean age (years after incorporation) is 55.7 and 43.3 for diversified and focused firms, respectively. Since larger and older firms generally have better access to external capital (Hadlock & Pierce 2010), diversified firms can be valued relatively highly under stressed capital market conditions, owing to their size and age. We check this possibility based on regressions in which capital market adversity interacts with a variable potentially confounding diversification, as well as diversification itself. In addition to firm size and age, we consider a firm's relationship with its main bank as a possible confounder, because diversified firms tend to have closer relationships with their banks.

Columns (1) and (2) of Table 7 present the results of the OLS and longitudinal regressions to check the influence of firm size, measured by logged total assets as in the previous regressions. The coefficient of the interaction term between firm size and capital market adversity is positive and highly significant. Hence, consistent with the above scenario, the value of larger firms increases when capital market conditions deteriorate. However, even when this tendency is accounted for, the coefficient of the interaction term between the diversification dummy and capital market adversity is significantly positive. This result increases our confidence in the role of firm scope. However, there is still a concern that drawing a clear line between the effects of firm size and scope is not easy because diversification makes firms larger. Accordingly, we also performed regressions in which the effect of business size, rather than firm size, was considered. To measure the business size of focused (single-business) firms, we use logged total assets because the business and firm sizes of these firms coincide. For diversified firms, we use the logged average assets of their segments as a proxy for the size of their representative business. Unlike firm size, which is positively correlated with diversification (ρ = 0.302), this measure of business size is uncorrelated with diversification (ρ = -0.015). The results of regressions incorporating the effects of business size are reported in Columns (1) and (2) of Table A1 in Appendix. These results confirm that the relative value of diversified firms increases with capital market adversity.[5] Therefore, diversified firms are valued highly under stressed capital market conditions, not merely because they are larger than focused firms.

Columns (3) and (4) of Table 7 consider the confounding effect of firm age. As implied by the financing advantages of older firms, the OLS regression results presented in Column (3) show that the estimated interaction effect between firm age and capital market adversity is significantly positive. However, as shown in Column (4), we do not observe a significant moderating effect of age when firm-

[5] We also performed regressions in which the size of diversified firms is measured as the asset of their largest segment (results unreported). These regression also show that the interaction effect between diversification and capital market adversity is significantly positive.

fixed effects are included in the regression. In contrast, the estimated interaction effect between diversification and capital market adversity is significantly positive and similar to the previous estimates, with and without firm-fixed effects. Columns (3) and (4) of Table A1 (Appendix) report the results of regression in which firm age is measured as years after initial public offering (IPO) rather than incorporation. These regressions also indicate that the estimated association between the value of diversified firms and capital market conditions is barely affected even when the time-varying effect of firm age is considered.

Columns (5) and (6) examine the influence of bank-firm relationships based on the ratio of equities owned by the firm's main bank (largest lender). This ratio is significantly higher for diversified firms than focused firms (2.1% vs. 1.7%). Moreover, the OLS regression result presented in Column (5) indicates that the interaction effect between the ratio and capital market adversity is significantly positive, suggesting that a close tie with the main bank shelters firms from capital market shocks (Peek & Rosengren 2005). However, as reported in Column (6), the interaction effect is not significant when the regression includes firm-fixed effects. By contrast, the coefficient of the interaction term between the diversification dummy and capital market adversity is significantly positive and similar to previous estimates, with and without firm-fixed effects.

Overall, the regression results presented in this section strongly suggest that the industrial scope of diversified firms is central to the observed contingency of their value on capital market conditions. In the next section, we delve deeper into this phenomenon by highlighting the role of internal capital markets.

4. Mechanisms

4.1. Coinsurance

Why does the value of diversification vary with external finance conditions? A leading explanation offered by previous studies is that coinsurance among divisions becomes more valuable

when capital markets are impaired (Yan 2006; Matvos & Seru 2014; Kuppuswamy & Villalonga 2016; Boguth *et al.* 2022). Coinsurance rooted in imperfect correlations of divisional cash flows is unavailable to focused firms. It enables diversified firms to substitute internal finance for costly external finance by increasing their ability to shift funds across divisions (Yan 2006; Leland 2007; Duchin 2010; Matvos & Seru 2014; Matvos *et al.* 2018). Coinsurance also improves a firm's access to external capital by reducing the credit risk of fund providers (Lewellen 1971; Kuppuswamy & Villalonga 2016). Accordingly, coinsurance generated by internal capital markets can protect diversified firms from capital market shocks.

This scenario implies that the relative value of diversified firms increases with worsening capital market conditions, particularly when their divisions have heterogeneous cash flow fluctuation patterns. Hann *et al.* (2013) demonstrate that coinsurance lowers diversified firms' cost of capital. Yan (2006), Kuppuswamy and Villalonga (2016), and Boguth *et al.* (2022) observe that when capital markets are impaired, the value of diversification increases, especially for financially constrained firms for which coinsurance is likely to be relatively more important. However, to the best of our knowledge, no previous studies have directly explored whether coinsurance moderates the effect of capital market conditions on the value of diversified firms. We perform this test using the empirical coinsurance measure developed by Duchin (2010) and Tong (2012).

This measure estimates coinsurance among a firm's segments based on the correlation of their industries' cash flows. Specifically, denoting the SD and correlation of industry cash flow as σ and ρ, respectively, firm i's coinsurance in year t is measured as follows:

$$c_{it} = \sqrt{\sum_{j}\sum_{k} w_{jt}w_{kt}\sigma_{jt}\sigma_{kt}} - \sqrt{\sum_{j}\sum_{k} w_{jt}w_{kt}\rho_{jk}\sigma_{jt}\sigma_{kt}} \quad . \qquad (4)$$

The second term on the right-hand side denotes the SD of a firm's cash flow when it operates in industry

j, with sales-weight w_{jt}. The first term is the SD when the firm's industries are fully synchronized in cash flow fluctuations (i.e., ρ = 1 for all j and k). Thus, the difference between these terms estimates a reduction in SD because of the imperfect correlation of industry cash flow. For focused firms, this is zero by construction. As the estimate of σ, we use the ten-year SD of focused firms' average EBITDA/sales in [*t*-10, *t*-1] for each 3-digit industry. ρ is estimated as the correlation of this ratio during the same ten-year interval.

We investigate how coinsurance moderates the effect of capital market conditions on the value of diversification by estimating the following model:

$$EV_{it} = \alpha + \beta_0 D_{it} + \beta_1 D_{it}(m_t - \overline{m}) + \beta_2 c_{it}(m_t - \overline{m}) + \beta_3 c_{it} + \gamma z_{it} + \varphi_t\ (+\theta_i) + \epsilon_{it}. \quad (5)$$

.

If coinsurance becomes more valuable when capital market conditions deteriorate, its interaction effect with capital market adversity (β_2) should be positive. In this specification, the total effect of capital market conditions on the value of diversification is $\beta_1 + \beta_2 c_{it}$, where $\beta_1$represents the effect when the measured coinsurance is zero. It can be positive because our coinsurance variable, measured at the industry-level, does not capture coinsurance rooted in the idiosyncratic dynamics of segmental cash flow.[6] Moreover, coinsurance is not the only mechanism that can increase the value of diversification under stressed capital market conditions. For instance, diversified firms can cope with a decline in external fund supply by selling noncore assets (Schlingemann *et al.* 2002). Diversified firms may also operate internal capital markets more efficiently when external capital is scarcer, as advanced by Yan *et al.* (2010), Kuppuswamy and Villalonga (2016), and Wang (2023). β_1 can capture the collective effect of these mechanisms.

Columns (1) and (2) of Table 8 present OLS and longitudinal regression results, respectively.

[6] Ideally, we would like to measure coinsurance based on historical data on a segment's own cash flow. However, most segments in our data lack sufficiently long time-series information.

In both regressions, the coefficient of the interaction term between coinsurance and capital market adversity is significantly positive. Therefore, consistent with the hypothesis that coinsurance becomes more valuable when external capital markets are impaired, the value of diversified firms increases with capital market adversity, particularly when their segments have heterogeneous cash flow fluctuation patterns. This result lends strong credence to the role of coinsurance in the observed dynamics of the relative value of diversified firms. These regression results also show that the interaction effect between the diversification dummy and capital market adversity is significantly positive, even when the influence of coinsurance is separately considered. As noted above, this can reflect coinsurance not captured by our industry-level proxy and/or mechanisms other than coinsurance, which also protect diversified firms from capital market shocks.

Another noteworthy result in Table 8 is that the estimated main effect of coinsurance is negative, although not significant in the OLS regression reported in Column (1). This pattern suggests that coinsurance entails the dark side. Amihud and Lev (1981) posit that self-interested managers diversify their firm to reduce the risk of their personal wealth, particularly human capital, through coinsurance. Gormley and Matsa (2016) claim that managers undertake risk-reducing, diversifying acquisitions to "play it safe." Banal-Estañol *et al.* (2013) point out that coinsurance is the flip side of negative financial synergy, which arises when one division's poor performance drags down other divisions that would have stayed afloat if they were a standalone entity. Our results suggest that, relative to such dark sides, investors value the bright side of coinsurance more when the cost and difficulty of external finance are higher.

4.2. Bankruptcy and underinvestment risks

The preceding analysis indicates that the effect of capital market conditions on the value of diversification varies across firms, depending on their ability to cross-subsidize divisions. When external capital is in short supply, firms can fail to survive by defaulting on their contractual obligations.

Even surviving firms can forgo attractive investment opportunities if they are underfunded. The financing advantages of diversified firms mitigate these risks. Accordingly, the effect of capital market conditions can vary across firms according to their exposure to bankruptcy and underinvestment risks. If a superior ability to fulfill contractual obligations is highly valued by investors under stressed capital market conditions, the value of diversification should increase, particularly for firms with high bankruptcy risk. We check this scenario using the Altman Z-score, an inverse measure of a firm's bankruptcy risk.[7] Similarly, we can infer the influece of underinvestment risk by examining whether the effect of capital market conditions is greater for firms with higher investment needs. Fee *et al.* (2008) and Seru (2014) demonstrate that internal capital markets affect intangible investments, such as R&D and advertising expenses, as well as investment in tangible assets. Therefore, our test of the influence of underinvestment risk is based on a firm's total investment intensity, measured as the sum of capital, R&D, and marketing expenditures normalized by sales.[8]

Columns (1) and (2) of Table 9 present the results of the OLS and longitudinal regressions, respectively, in which the Z-score interacts with the diversification dummy, capital market adversity, and cross-term of these variables. In both regressions, the main effect of the Z-score and its interaction effect with capital market adversity are significantly positive. Therefore, firms with higher bankruptcy risk are discounted, especially when external financing is costly or difficult to obtain. However, the coefficient of the interaction term among the diversification dummy, Z-score, and capital market adversity is significantly negative, indicating that when high-risk firms are diversified, their value declines less under stressed capital market conditions. Meanwhile, as in the previous regressions, the coefficient of the interaction term between diversification and capital market adversity is significantly positive. Accordingly, the estimated coefficient of the triple interaction term also implies that when

[7] Z-score is defined as 1.2 (working capital/total assets) + 1.4 (retained earnings/total assets) + 3.3 (EBIT/total assets) + 0.6 (market equity/liabilities) + 1.0 (sales/total assets).
[8] We jointly consider these three types of investment for brevity. Our results are similar to those reported when we examine each type of investment separately.

capital market conditions deteriorate, the value of diversification increases, particularly for firms with high bankruptcy risk.

The regressions in Columns (3) and (4) consider the moderating role of investment intensity. These regressions exclude the independent term of this variable because it is collinear with the intensities of capital, R&D, and marketing expenditures, which are included as control variables. The coefficient of the interaction term between the diversification dummy and investment intensity is significantly positive. This pattern suggests that the financial benefits of diversification are more valuable to firms that actively invest in tangible and intangible assets. However, unlike the case of the Z-score, the coefficient of the triple interaction term between the diversification dummy, capital market adversity, and investment intensity is not significant. Hence, the effect of capital market conditions on the value of diversification is not particularly large for firms with high funding needs for tangible and intangible investments.

Taken together, the regression results presented in Table 9 suggest that the value of diversified firms increases under stressed capital market conditions, mainly because their financing advantages improve their ability to operate as a solvent entity, even when external capital is in short supply. This finding echoes Singhal and Zhu (2013) reporting the lower bankruptcy risk of diversified firms. It is also consistent with Hann *et al.* (2013) who posit that coinsurance lowers the cost of capital for diversified firms by protecting their contractual relationships with stakeholders.

5. Conclusions

This study examines the influence of capital market conditions on the value of diversification for Japanese firms. As documented by previous studies on US firms (Yan 2006; Kuppuswamy & Villalonga 2016; Boguth *et al.* 2022), the relative value of diversified firms vis-à-vis focused firms increases when external capital is costlier or more difficult to access. Our analysis identified two moderating factors of this pattern. The first is coinsurance, which is rooted in the imperfect correlations

of divisional cash flows. The value of diversified firms increases with capital market adversity, particularly when their divisions have a high cross-subsidizing ability, because of the heterogeneous dynamics of their industries' cash flows. The second factor is bankruptcy risk. The effect of capital market conditions on the value of diversification is greater when a decline in external capital supply poses a more serious threat to a firm's survival.

These results strongly suggest that the observed dynamics in the value of diversified firms reflect changes in the relative value of external and internal capital markets. When external capital is costly or difficult to access, the financing advantages of diversified firms generated by their internal capital markets are valued more highly, especially when they are vulnerable to external finance conditions. These results suggest that despite possible biases and measurement errors, the relative value of diversified and focused firms contains useful information on the value of diversification. Our results also support the theorem that the value of organizations depends on what the market can do, not just what they can do (Coase 1937; Williamson 1975). Given the fundamentality of this theorem in economics and the ubiquity of corporate diversification worldwide, similar patterns can be observed in many other economies.

An interesting implication of our results is that the discount for diversified firms can emanate from external factors rather than internal factors traditionally stressed in the literature, such as agency problems and socialistic resource allocation. In particular, the large discount for diversified firms in Japan during the 2010s can be caused by the BOJ's highly expansionary monetary policies, which were introduced as a remedy for the long-term stagnation of the domestic economy. In this regard, this study also contributes to the ongoing policy debate by highlighting a previously unknown side effect of these drastic policies.

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Table 1: Descriptive statistics of sales- and asset-based excess values

	Obs	Mean	P5	P25	Median	P75	P95	SD
Sales-based excess value								
(A) Diversified firms	30,241	-0.030	-1.107	-0.445	-0.042	0.360	1.093	0.662
(B) Focused firms	30,626	0.070	-1.048	-0.369	0.000	0.408	1.526	0.743
Difference (A) - (B)		-0.100 ***			-0.042 ***			
Asset-based excess value								
(A) Diversified firms	22,592	-0.048	-0.789	-0.323	-0.056	0.199	0.645	0.441
(B) Focused firms	30,648	0.044	-0.814	-0.280	0.000	0.294	1.122	0.553
Difference (A) - (B)		-0.091 ***			-0.056 ***			

Note: This table presents the descriptive statistics of sales- and asset-based excess values. Excess value is defined as the logged ratio of firm value (market equity plus book value of debt) to the sum of the imputed value of segments (segmental sales or assets times the median multiple of focused firms in the same industry). Segments are matched to an industry at the JSIC 4-digit or finest level at which at least five focused (single-segment) firms exist. Obs denotes the number of observations. P denotes percentile. The statistical significance of the difference in the mean (median) is based on the t-test (Wilcoxon rank sum test). *** denotes significant at the 0.01 level.

Table 2: Descriptive statistics of firm-level regression variables

Variable	Definition	obs	Mean	SD	Min	Median	Max
Diversification dummy	1 if the firm operates multiple 4-digit segments, 0 otherwise	60,675	0.498	0.500	0	0	1
Firm size	Logged asset	60,675	10.37	1.605	6.936	10.25	14.74
Profitability	EBITD/Sales	60,675	0.085	0.087	-0.246	0.073	0.402
Investment	Capex/Sales	60,675	0.042	0.055	0	0.025	0.341
Leverage	Debt/Market equity	60,675	0.798	1.294	0	0.298	7.628
R&D intensity	R&D expenditure/Sales	60,675	0.015	0.030	0	0.003	0.185
Marketing intensity	Advertising and sales promotion expenditures /Sales	60,675	0.015	0.035	0	0.000	0.213
Firm age	Number of years after incorporation	60,675	49.45	24.03	4	52	109
Main bank ownership	Equity ownership by the main bank (largest lender)	59,295	0.019	0.018	0	0.016	0.050
Coinsurance	Coinsurance in cash flow among segments	60,557	0.001	0.002	0	0	0.009
Z score	Altman Z score	60,554	3.520	3.513	0.107	2.638	25.75

Note: This table reports the descriptive statistics of firm-level regression variables. All non-dummy variables are winsorized at the top and bottom 1%. RVA is multiplied by 100 as done by Rajan et al. (2000).

Table 3: Baseline regressions of sales- and asset-based excess value

Dependent variable	Sales-based excess value						Asset-based excess value					
Estimation method	OLS		Fama-MacBeth		FE		OLS		Fama-MacBeth		FE	
	(1)		(2)		(3)		(4)		(5)		(6)	
Diversification	-0.083	(0.015) ***	-0.088	(0.007) ***	-0.079	(0.018) ***	-0.069	(0.012) ***	-0.065	(0.008) ***	-0.042	(0.013) ***
Firm size	-0.021	(0.005) ***	-0.018	(0.007) **	0.008	(0.020)	-0.017	(0.004) ***	-0.018	(0.005) ***	-0.130	(0.015) ***
Profitability	2.255	(0.130) ***	2.263	(0.096) ***	1.107	(0.095) ***	0.564	(0.189) ***	0.993	(0.131) ***	0.398	(0.161) **
Investment	1.917	(0.145) ***	1.942	(0.104) ***	0.823	(0.069) ***	0.560	(0.119) ***	0.344	(0.060) ***	0.184	(0.055) ***
Leverage	0.055	(0.005) ***	0.034	(0.008) ***	0.024	(0.004) ***	0.005	(0.003)	-0.014	(0.008)	-0.003	(0.003)
R&D intensity	3.300	(0.396) ***	3.165	(0.131) ***	1.475	(0.427) ***	1.450	(0.242) ***	1.397	(0.092) ***	-1.379	(0.392) ***
Marketing intensity	1.353	(0.249) ***	1.281	(0.075) ***	0.062	(0.366)	1.109	(0.202) ***	0.985	(0.090) ***	0.221	(0.313)
Year fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Firm fixed effects	No		No		Yes		No		No		Yes	
# Observations	60,675		60,675		60,675		53,024		53,024		53,024	
Adjusted R-squared	0.157		0.167		0.756		0.050		0.077		0.635	

Note: This table presents the regression results of the sales-based excess value in Columns (1) to (3) and the asset-based excess value in Columns (4) to (6). In parentheses are standard errors clustered by firms. *** Significant at the 0.01 level. ** Significant at the 0.05 level.

Table 4: The value of diversification by year

	Difference in Mean	Difference in Median	OLS coefficient	(SE)	
2000	0.024	0.079	-0.039	(0.026)	
2001	0.048	0.099	-0.039	(0.024)	
2002	0.014	0.065	-0.086	(0.025)	***
2003	0.002	0.054	-0.051	(0.024)	**
2004	-0.121	-0.023	-0.126	(0.025)	***
2005	-0.169	-0.081	-0.111	(0.025)	***
2006	-0.139	-0.068	-0.085	(0.024)	***
2007	-0.094	-0.017	-0.092	(0.023)	***
2008	-0.056	0.008	-0.083	(0.024)	***
2009	-0.035	0.003	-0.073	(0.024)	***
2010	-0.040	0.007	-0.075	(0.024)	***
2011	-0.139	-0.083	-0.110	(0.023)	***
2012	-0.064	-0.022	-0.041	(0.024)	*
2013	-0.116	-0.058	-0.055	(0.026)	**
2014	-0.165	-0.120	-0.102	(0.026)	***
2015	-0.172	-0.113	-0.101	(0.026)	***
2016	-0.144	-0.067	-0.094	(0.026)	***
2017	-0.200	-0.150	-0.137	(0.026)	***
2018	-0.214	-0.169	-0.127	(0.026)	***
2019	-0.200	-0.133	-0.136	(0.026)	***

Note: This table presents the value of diversification estimated for each year based on the sales-based excess value. The difference in mean (median) is the mean (median) excess value of diversified firms minus the corresponding value for focused firms. The OLS coefficient denotes the estimated coefficient for diversification dummy in the yearly cross-sectional regressions, which were used to derive the Fama-MacBeth estimation results reported in Column (2) of Table 3. SE denotes standard error. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 5: Macroeconomic variables and their correlations with the value of diversification

Variable	Definition	obs	Mean	SD	Correlation with Difference in Mean	Correlation with Difference in Median	Correlation with OLS coefficient of diversification
Lending rate	Average contract interest rate of banks (%)	20	1.461	0.358	0.813	0.872	0.587
Bond spread	T-spread on corporate bonds (% point)	18	0.336	0.141	0.231	0.109	0.317
Lending attitude	Lending attitude of financial institutions	20	17.83	9.96	-0.683	-0.624	-0.458
Bank returns	Monthly returns on bank stocks	20	-0.001	0.020	-0.236	-0.175	-0.061
M/B ratio	Nonfinancial firms' average market to book rati	20	0.986	0.232	-0.666	-0.583	-0.556
Firm failures	Number of bankrupt firms (1000)	20	12.307	3.195	0.912	0.933	0.637
Jobless rate	Unemployment rate (%)	20	4.115	0.929	0.824	0.833	0.635
GDP growth	Growth rate of real GDP (%)	20	0.758	1.986	-0.070	-0.012	0.049
Capital market adversity	1st principal component of eight variables	20	0.000	1.971	0.886	0.856	0.650

Note: This table presents the definition and descriptive statistics of macroeconomic variables used to measure capital market conditions and their correlation with the estimated value of diversification based on the sales-based excess value. Correlation is reported for the differences in the mean and median excess values (diversified firms minus focused firms) and the OLS coefficient of the diversification dummy obtained from yearly cross-sectional regressions. All data were taken from the Nikkei NEEDS financial database, except for the bond spread obtained from Nomura Securities. Capital market adversity is the first principal component of the eight macroeconomic variables. To obtain this synthetic variable, we estimate the values of bond spread for 2000 and 2001 by extrapolating the regression of bond spread on seven other variables estimated for 2002 to 2019.

Table 6: Regressions of the interaction effect between diversification and capital market conditions

Macroeconomic variable	(1) Lending rate	(2) Bond spread	(3) Lending attitude	(4) Bank returns	(5) M/B ratio	(6) Firm failures	(7) Jobless rate	(8) GDP growth	(9) Capital market adversity
Panel A: OLS estimations (all firms)									
Diversification	-0.083 ***	-0.089 ***	-0.083 ***	-0.083 ***	-0.082 ***	-0.083 ***	-0.083 ***	-0.083 ***	-0.083 ***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Diversification ×	0.125 ***	0.148 ***	-0.004 ***	-0.849 ***	-0.186 ***	0.015 ***	0.053 ***	-0.003 *	0.028 ***
Macroeconomic variable	(0.028)	(0.042)	(0.001)	(0.236)	(0.023)	(0.003)	(0.010)	(0.002)	(0.004)
# observations	60,675	54,770	60,675	60,675	60,675	60,675	60,675	60,675	60,675
Adjusted R-squared	0.158	0.155	0.158	0.157	0.158	0.158	0.158	0.157	0.158
Panel B: OLS estimations (constant firm scope)									
Diversification	-0.127 ***	-0.132 ***	-0.125 ***	-0.125 ***	-0.123 ***	-0.127 ***	-0.125 ***	-0.125 ***	-0.125 ***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Diversification ×	0.172 ***	0.124 **	-0.005 ***	-0.682 ***	-0.210 ***	0.020 ***	0.071 ***	-0.002	0.035 ***
Macroeconomic variable	(0.030)	(0.049)	(0.001)	(0.265)	(0.027)	(0.003)	(0.011)	(0.002)	(0.005)
# observations	38,715	34,697	38,715	38,715	38,715	38,715	38,715	38,715	38,715
Adjusted R-squared	0.181	0.179	0.180	0.179	0.181	0.182	0.181	0.180	0.182
Panel C: Longitudinal estimations (all firms)									
Diversification	-0.058 ***	-0.068 ***	-0.057 ***	-0.057 ***	-0.057 ***	-0.057 ***	-0.057 ***	-0.057 ***	-0.058 ***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Diversification ×	0.074 ***	0.169 ***	-0.003 ***	-0.635 ***	-0.160 ***	0.011 ***	0.036 ***	-0.003 **	0.020 ***
Macroeconomic variable	(0.024)	(0.032)	(0.001)	(0.186)	(0.019)	(0.002)	(0.008)	(0.002)	(0.003)
# observations	60,675	54,770	60,675	60,675	60,675	60,675	60,675	60,675	60,675
Adjusted R-squared	0.699	0.711	0.699	0.699	0.699	0.699	0.699	0.699	0.699

Note: This table presents the estimated coefficients of the diversification dummy and its interaction term with the macroeconomic variables. All regressions include control variables, which are the same as those of the regressions in Table 3, and year-fixed effects. The regressions tabulated in Panel C include firm-fixed effects. The estimation sample for the regressions in Panel B is limited to firms that remained focused/diversified throughout the sample period. In parentheses are standard errors clustered by firms. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 7: Regressions of the moderating effects of firm size, age, and main bank relationship

	(1)	(2)	(3)	(4)	(5)	(6)
Diversification	-0.086 ***	-0.055 ***	-0.068 ***	-0.055 ***	-0.076 ***	-0.057 ***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)
Diversification × Capital market adversity	0.015 ***	0.015 ***	0.023 ***	0.024 ***	0.022 ***	0.020 ***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Firm size	-0.050 ***	-0.027				
	(0.008)	(0.019)				
Firm size × Capital market adversity	0.013 ***	0.007 ***				
	(0.001)	(0.001)				
Firm size × Diversification	0.054 ***	0.049 ***				
	(0.010)	(0.011)				
Firm age			-0.005 ***	0.005		
			(0.001)	(0.008)		
Firm age × Capital market adversity			0.000 ***	0.000		
			(0.000)	(0.000)		
Firm age × Diversification			0.005 ***	0.002 ***		
			(0.001)	(0.001)		
Main bank ownership					-5.263 ***	-1.547 **
					(0.603)	(0.624)
Main bank ownership × Capital market adversity					0.357 ***	0.025
					(0.107)	(0.096)
Main bank ownership × Diversification					3.315 ***	1.737 ***
					(0.743)	(0.671)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm-fixed effects	No	Yes	No	Yes	No	Yes
# Observations	60,675	60,675	60,675	60,675	59,295	59,295
Adjusted R-squared	0.164	0.701	0.171	0.700	0.168	0.696

Note: :This table presents the results of regressions that consider the moderating effects of firm size, age, and main bank relationship on the influence of capital market conditions on excess value. All regressions include the same control variables as those in the previous regressions and year-fixed effects. The regressions in the even-numbered columns include firm-fixed effects. In parentheses are standard errors clustered by firms. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 8: Regressions of the interaction effect between capital market adversity and coinsurance

	(1)	(2)
Diversification	-0.077 ***	-0.041 ***
	(0.016)	(0.016)
Diversification × Capital market adversity	0.020 ***	0.014 ***
	(0.005)	(0.004)
Coinsurance	-0.026	-0.131 ***
	(0.044)	(0.037)
Coinsurance × Capital market adversity	0.037 **	0.030 **
	(0.015)	(0.012)
Control variables	Yes	Yes
Year-fixed effects	Yes	Yes
Firm-fixed effects	No	Yes
# Observations	60,557	60,557
Adjusted R-squared	0.158	0.700

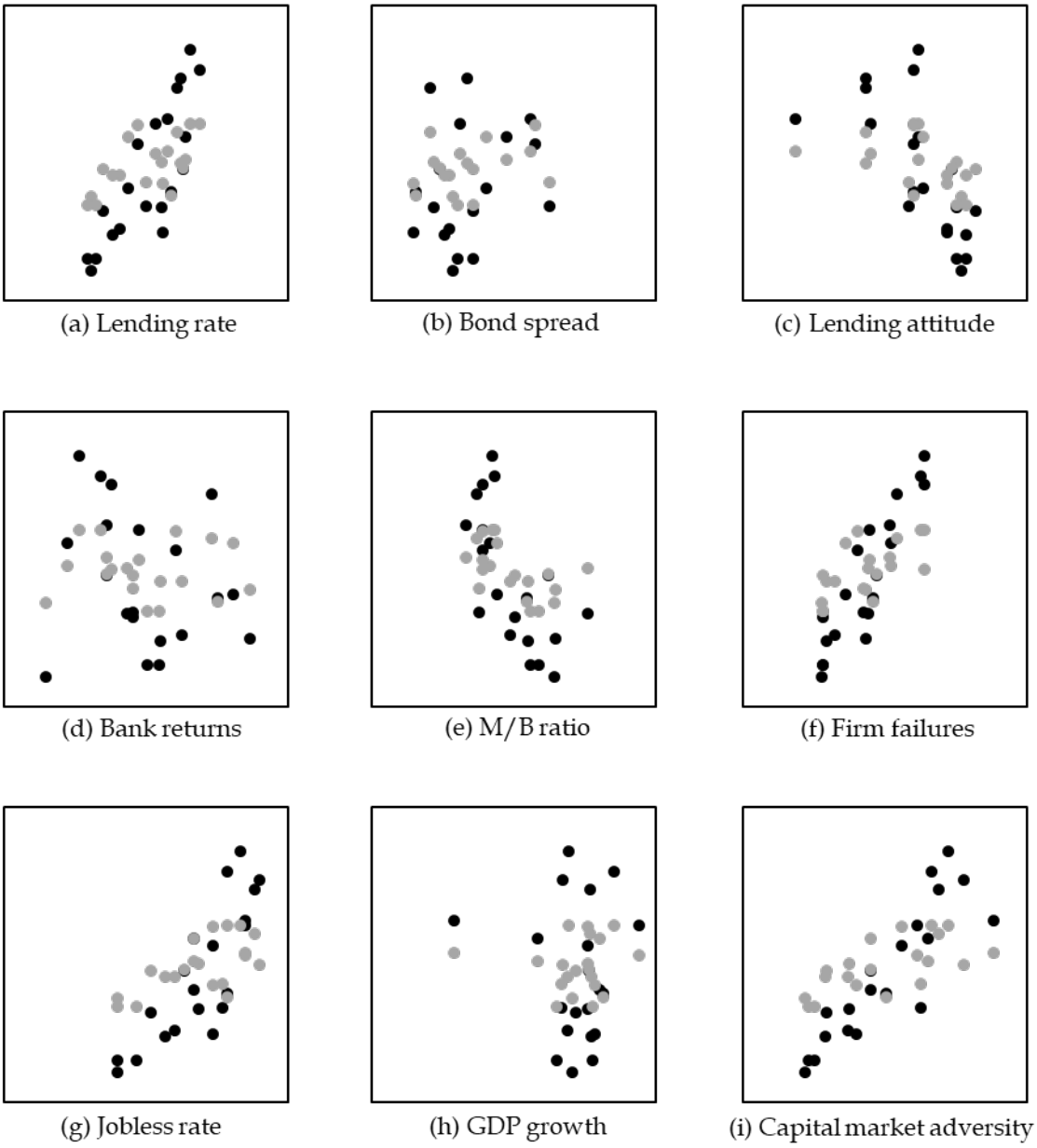
Note: This table presents the results of regressions that examine the moderating effect of coinsurance on the influence of capital market conditions on the value of diversification. The dependent variable is excess value. Coinsurance is multiplied by 100 to obtain a clear representation of the estimated coefficients. Both regressions include the same control variables as those used in the previous regressions. In parentheses are standard errors clustered by firms. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 9: Regressions of the moderating effects of default and underinvestment risks

	(1)	(2)	(3)	(4)
Diversification	-0.061 ***	-0.041 ***	-0.082 ***	-0.059 ***
	(0.014)	(0.015)	(0.015)	(0.015)
Diversification × Capital market adversity	0.008 *	0.017 ***	0.028 ***	0.020 ***
	(0.004)	(0.004)	(0.004)	(0.003)
Z-score	0.075 ***	0.064 ***		
	(0.003)	(0.003)		
Z-score× Capital market adversity	0.002 **	0.004 ***		
	(0.001)	(0.001)		
Diversification × Z-score × Capital market adversity	-0.007 ***	-0.003 *		
	(0.002)	(0.002)		
Z-score× Diversification	-0.008 *	0.011 ***		
	(0.004)	(0.004)		
Investment intensity × Capital market adversity			0.017	0.085 **
			(0.054)	(0.036)
Diversification × Investment intensity × Capital market adversity			-0.004	-0.003
			(0.071)	(0.049)
Diversification × Investment intensity			0.674 ***	0.705 ***
			(0.198)	(0.141)
Control variables	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Firm-fixed effects	No	Yes	No	Yes
# Observations	60,672	60,672	60,675	60,675
Adjusted R-squared	0.253	0.728	0.159	0.700

Note: This table presents the results of regressions that examine the moderating effects of a firm's default and underinvestment risks on the influence of capital market conditions on the value of diversification. The dependent variable is excess value. All regressions include control variables that are the same as those in the previous regressions. The regressions in Columns (2) and (4) include firm-fixed effects. In parentheses are standard errors clustered by firms. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Figure 1: The value of diversification and capital market conditions



Note: These diagrams show how the value of diversification, measured on the vertical axis as the difference in mean excess value between diversified and focused firms (black dots) and the OLS coefficient on the diversification dummy (gray dots), varies with the designated macroeconomic variable measured on the horizontal axis.

Appendix

Table A1: Regressions using alternative measures of firm size and age

	(1)	(2)	(3)	(4)
Diversification	-0.108 ***	-0.060 ***	-0.077 ***	-0.053 ***
	(0.014)	(0.020)	(0.015)	(0.015)
Diversification × Capital market adversity	0.028 ***	0.023 ***	0.020 ***	0.022 ***
	(0.004)	(0.004)	(0.005)	(0.004)
Business size	-0.051 ***	-0.028		
	(0.008)	(0.017)		
Business size × Capital market adversity	0.012 ***	0.007 ***		
	(0.001)	(0.001)		
Business size × Diversification	0.054 ***	0.051 ***		
	(0.010)	(0.011)		
Listing age			-0.003 ***	-0.007 ***
			(0.001)	(0.001)
Listing age × Capital market adversity			0.001 ***	0.000 ***
			(0.000)	(0.000)
Listing age × Diversification			0.005 ***	0.003 ***
			(0.001)	(0.001)
Control variables	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Firm-fixed effects	No	Yes	No	Yes
# Observations	60,675	60,675	57,989	57,989
Adjusted R-squared	0.164	0.701	0.163	0.691

Note: This table reports the results of regressions using alternative size and age measures. The dependent variable is sales-based excess value. Columns (1) and (2) measures business size as the logged average value of segmental assets for diversified firms and as the logged total assets for focused firms. Columns (3) and (4) measure firm age as listing age (years after IPO). All regressions include control variables that are the same as those in the previous regressions. The regressions in Columns (2) and (4) include firm-fixed effects. In parentheses are standard errors clustered by firms. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.