

## International Evidence on the Value of Corporate Diversification

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### ABSTRACT

The valuation effect of diversification is examined for large samples of firms in Germany, Japan, and the United Kingdom for 1992 and 1994. We find no significant diversification discount in Germany, but a significant diversification discount of 10 percent in Japan and 15 percent in the U.K. Concentrated ownership in the hands of insiders enhances the valuation effect of diversification in Germany, but not in Japan or the U.K. For Japan, only firms with strong links to an industrial group have a diversification discount. These findings suggest that international differences in corporate governance affect the impact of diversification on shareholder wealth.

RECENT EVIDENCE SUGGESTS THAT DIVERSIFICATION has not been beneficial for U.S. corporations over the last three decades (see Lang and Stulz (1994), Berger and Ofek (1995), and Servaes (1996)).<sup>1</sup> This indicates that, on average, firms have not been able to exploit the potential benefits associated with diversification while controlling the costs. Benefits include the creation of an internal capital market void of information asymmetries (Williamson (1975), Stein (1997)), the improved ability to take advantage of the tax benefits of debt financing (Lewellen (1971)), and economies of scope (Teece (1980)). The main costs associated with diversification are that it may be rooted in agency problems (see Jensen (1986), Stulz (1990), and Meyer, Milgrom, and Roberts (1992)) or lead to power struggles between divisions (Rajan and Zingales (1998) and Rajan, Servaes, and Zingales (2000)). This suggests that

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<sup>1</sup> See, however, Matsusaka (1993) and Hubbard and Palia (1999), who find positive announcement effects associated with diversifying acquisitions during the 1960s.

firms often engage in diversification without the best interests of shareholders in mind. Scharfstein and Stein (1997), Matsusaka and Nanda (1996), and Rajan et al. (2000) consider the improved allocation of capital in an internal capital market as well as the associated costs.<sup>2</sup>

In this paper, we examine whether companies in Germany, Japan, and the United Kingdom have been able to overcome the costs associated with diversification, and therefore have enhanced shareholder wealth in the process of diversifying. The institutional environment in Germany and Japan is very different from that in the United States, and various authors have suggested that agency problems may be less severe in those countries (e.g., see Grundfest (1990) and Prowse (1990)), partly because they have a more concentrated corporate ownership structure. Despite their overall similarity in institutional environment, a number of differences exist between the corporate organizational structures in Germany and Japan. For example, bank ownership is limited in Japan, but not in Germany, and many Japanese firms belong to industrial groups, better known as *keiretsu* organizations; such a formal group structure does not exist in Germany. Both countries lack an active takeover market, but recent evidence suggests that internal control mechanisms play an important role in the disciplining of poorly performing managers in both Germany and Japan (Kaplan (1994a, 1994b) and Kang and Shivdasani (1995)). The institutional environment in the United Kingdom, on the other hand, is similar to that in the United States. Share ownership by banks is limited by law (Roe (1990)), most companies have few large shareholders, and intercorporate equity holdings are small (Franks and Mayer (1998)). Thus, studying the U.K. provides an opportunity to verify whether diversification has also led to shareholder losses in this economy.

Our results support the notion that the effect of diversification on firm value is different across countries. For samples that contain all German exchange-listed firms at the end of 1992 and 1994, we find no evidence that diversification reduces shareholder wealth. There is no evidence that shareholders benefit from diversification either, which suggests that the costs and benefits offset each other. Unfortunately, because there are relatively few firms in our German sample, the effect of diversification on corporate value is estimated imprecisely. Thus, although the effect is not significantly different from zero, it is not significantly different from the effects for other countries either.

Our results are more conclusive for samples of Japanese and U.K. companies, where we find a diversification discount of approximately 10 percent and 15 percent, respectively (using the methodology proposed by Berger and Ofek (1995)). The discount for the United Kingdom is very similar to the discount reported by Berger and Ofek for the United States, whereas the Japanese discount is significantly smaller.

<sup>2</sup> Recent empirical work on the functioning of internal capital markets includes Lamont (1997), Shin and Stulz (1998), Houston, James, and Marcus (1997), Rajan et al. (2000), and Scharfstein (1997).

To shed further light on these findings, we gather data on the ownership structure and industrial group membership (for Japan) of the firms in our 1994 sample. Since ownership concentration is highest in Germany, followed by Japan and the U.K., we explore whether ownership concentration is related to the diversification discount in these countries. In Germany, we find a diversification discount only when insider ownership is below five percent. In contrast, insider ownership does not affect the diversification discount for Japan or for the U.K. For Japan, we also examine whether the industrial group structure affects the diversification discount and find that diversified firms in Japan do not trade at a discount unless they have a strong link with an industrial group. This is consistent with an agency cost interpretation. If the groups act as conglomerate organizations, then individual group members do not need to be diversified to reap the benefits of diversification. Without the benefits, only the costs matter. In our sample, diversified firms with a strong association to an industrial group trade at a discount of 30 percent.

Overall, these results suggest that the value of diversification is related to the institutional structure of a country. However, no consistent pattern emerges across countries.

The remainder of this paper is organized as follows. Section I contains a description of our data collection procedure and our methodology., Section II contains the valuation results, and Section III provides robustness checks. Section IV contains the corporate governance results, and Section V concludes.

## **I. Data Collection and Methodology**

### *A. Data and Descriptive Statistics*

We gather a sample of publicly traded firms from Germany, Japan, and the United Kingdom from the *Worldscope* database in 1994 and 1996. *Worldscope* provides financial and ownership data for a large number of companies (public and private) from 47 countries. We use data for the fiscal year-end closest to December 31, 1992 and 1994 for the U.K. and Germany, and closest to March 31, 1993 and 1995 for Japan.

Table I lists the number of companies at the start of the sample selection procedure and the number of firms that drop out after applying several screens to the data. We start with the entire universe of firms on *Worldscope*. Since we need market values for the companies in our study, we exclude private companies from the analysis. We also exclude corporations that are not listed on the country's major stock exchanges. We exclude all companies whose main line of business is in the financial or the services industries (SIC 6000–9999). Financial firms are eliminated because our main valuation measure, the market-to-sales ratio, cannot be computed for this industry since sales figures are provided only sporadically for financial services companies. Service firms are excluded because we find few of them in Germany, and we want to maintain consistency for all countries. All German

**Table I**  
**Sample Selection Procedure**

Data are gathered from the Worldscope database. Excluded from the sample are: private firms, firms not traded on major stock exchanges (Frankfurt and Düsseldorf for Germany, Tokyo and Osaka for Japan, and London for the United Kingdom), firms in the financial or services industries, firms classified as diversified that do not report segment sales, and firms diversified into the financial or services industries.

|  | 1992    |       |                | 1994    |       |                |
|--|---------|-------|----------------|---------|-------|----------------|
|  | Germany | Japan | United Kingdom | Germany | Japan | United Kingdom |
| Number of firms on Worldscope  | 467     | 1619  | 1703           | 564     | 2076  | 1797           |
| Subtract:  | ⟨225⟩   | ⟨100⟩ | ⟨297⟩          | ⟨261⟩   | ⟨178⟩ | ⟨405⟩          |
| a. Private firms   |         |       |                |         |       |                |
| b. Firms not traded on major stock exchanges                           |         |       |                |         |       |                |
| Subtract: Firms in the financial or services industries                | ⟨56⟩    | ⟨298⟩ | ⟨466⟩          | ⟨62⟩    | ⟨258⟩ | ⟨490⟩          |
| Firms remaining  | 186     | 1221  | 940            | 241     | 1640  | 902            |
| Random sample for Japan and the U.K.                                   | 186     | 900   | 450            | 241     | 900   | 450            |
| Subtract:  | ⟨12⟩    | ⟨92⟩  | ⟨59⟩           | ⟨14⟩    | ⟨122⟩ | ⟨109⟩          |
| a. Firms classified as diversified that do not report sales by segment |         |       |                |         |       |                |
| b. Firms diversified in the financial or services industry             |         |       |                |         |       |                |
| Final sample   | 174     | 808   | 391            | 227     | 778   | 341            |

companies that remain after applying these screens are included in our subsequent analysis. For Japan and the U.K. we collect random samples of 900 and 450 companies, respectively, to keep the data collection process manageable. We collect larger samples for Japan because subsequent tests focus on the industrial group structure, and we want to make sure that we have a sufficient number of diversified firms affiliated with industrial groups to draw inferences that are both statistically and economically meaningful.

We measure diversification at the firm level, but firms can also diversify through membership in industrial groups. For Japan, we examine in Section IV.C whether group membership affects the benefits of diversification at the firm level, but we do not study the valuation effect of diversification at the group level.

We classify firms as diversified when they report sales in two or more segments (defined at the two-digit SIC code level), and the most important segment accounts for less than 90 percent of total sales. This 90 percent cutoff leads to a diversification classification similar to the one companies are required to follow in the United States.<sup>3</sup> We base our analysis exclusively on sales because we can get consistent segment data for all three countries on this variable only; data on segment profitability and assets are very sparse. Diversification is defined at the two-digit SIC code level since U.S. evidence suggests that there are no penalties for related diversification (see Berger and Ofek (1995)). Firms that are vertically integrated between manufacturing and distribution are classified as single-segment firms, but our results are not affected by this procedure.

We further eliminate companies for which Worldscope reports multiple SIC codes, but for which all sales are grouped together. We assume that these companies are diversified, but because they lack segment data, it is impossible to analyze the valuation of the segments.<sup>4</sup> The name of the segment provided in the financial statements can usually be linked to the SIC code reported by Worldscope. However, when the segment description differs from the Worldscope industry code, we assign the firm to the proper industry based on this description. In other words, we correct the SIC codes reported by Worldscope when necessary. When we are unable to link a segment description to a specific industry, we exclude the company from the sample.

<sup>3</sup> Worldscope reports the percentage of sales in each segment. The percentages always sum to 100. Thus, we do not encounter the problem faced by Berger and Ofek (1995) that the sum of the sales in each segment sometimes deviates from total firm sales.

<sup>4</sup> Segment disclosure requirements in the U.K. and Japan are similar to those in the United States, although these regulations have been adopted fairly recently. German firms have more discretion in reporting segment data. Neither U.K. nor German companies are required to disclose segment information if it compromises their competitive position. (See Roberts, Weetman, and Gordon (1998) for more information.) Few diversified firms are excluded from our sample because of a lack of segment disclosure information: three percent of German and U.K. firms in 1992, two percent of German and U.K. firms in 1994, and two percent of Japanese firms in 1992 (none in 1994). Moreover, the raw market-to-sales ratios of the excluded firms are similar to those of the firms included in our sample. We therefore do not believe that the lack of disclosure of segment information for these firms affects our findings.

**Table II**  
**Sample Distribution and Descriptive Statistics**

Diversified firms are firms that operate in two or more two-digit SIC code industries. Single-segment firms are firms that operate in only one two-digit SIC code industry. Number of segments is the number of different two-digit SIC codes in which the firm operates. Total capital is defined as book value of debt plus market value of equity. The leverage ratio is defined as book value of debt divided by total assets. Operating income is measured net of depreciation and amortization for Japan. Data on capital expenditures are not available for Japan. The values reported for total assets and total capital have been converted to millions of U.S. dollars using the exchange rate provided by Worldscope.

|  | Germany |  | Japan    |  | United Kingdom |  |
|--|---------|--|----------|--|----------------|--|
| Number (% of total firms) that are diversified in 1992 | 64(37%) |  | 331(41%) |  | 150(38%)       |  |
| Number (% of total firms) that are diversified in 1994 | 81(36%) |  | 303(40%) |  | 138(40%)       |  |

  

|                            | Germany |        | Japan |        | United Kingdom |        |
|----------------------------|---------|--------|-------|--------|----------------|--------|
|                            | Mean    | Median | Mean  | Median | Mean           | Median |
| <b>1992</b>                |         |        |       |        |                |        |
| Number of segments         | 1.58    | 1      | 1.54  | 1      | 1.63           | 1      |
| Total assets (\$MM)        | 2656    | 540    | 3423  | 888    | 1016           | 78     |
| Total capital (\$MM)       | 1462    | 395    | 3048  | 949    | 908            | 69     |
| Leverage ratio             | 0.180   | 0.129  | 0.298 | 0.292  | 0.205          | 0.199  |
| Operating income/sales     | 0.054   | 0.056  | 0.052 | 0.046  | 0.104          | 0.092  |
| Capital expenditures/sales | 0.079   | 0.065  | —     | —      | 0.077          | 0.034  |
| <b>1994</b>                |         |        |       |        |                |        |
| Number of segments         | 1.67    | 1      | 1.53  | 1      | 1.66           | 1      |
| Total assets (\$MM)        | 3239    | 490    | 2804  | 612    | 1213           | 92     |
| Total capital (\$MM)       | 1825    | 431    | 3597  | 773    | 1331           | 100    |
| Leverage ratio             | 0.177   | 0.143  | 0.311 | 0.292  | 0.201          | 0.174  |
| Operating income/sales     | 0.046   | 0.046  | 0.035 | 0.032  | 0.115          | 0.094  |
| Capital expenditures/sales | 0.072   | 0.045  | —     | —      | 0.070          | 0.038  |

Finally, we eliminate firms that have diversified into the financial or services industries to avoid potential bias in our imputation of diversified firm values. After applying all these screens, our 1992 sample contains 174 German firms, 808 Japanese firms, and 391 U.K. firms, and our 1994 sample contains 227 German firms, 778 Japanese firms, and 341 U.K. firms.

Table II contains descriptive statistics on the firms in our sample. Approximately 37 percent of German firms are diversified (36 percent in 1994); the percentages for Japan and the U.K. are 41 percent and 38 percent, respectively (40 percent for both countries in 1994). This compares to a rate of diversification in the United States of 26 percent in 1992 and 23 percent in 1994. There is little difference between the average number of segments reported by the firms in the three countries. There are substantial differences, however, in firm size across the three countries. German and Japanese companies are much larger in terms of both total assets and total capital (market value of equity plus book value of debt) than U.K. companies. In 1992 the median U.K. firm has total assets of \$78 million and the median

Japanese firm has assets of \$888 million. This is consistent with the discussion in the introduction, which indicates that the U.K. is more of a stock-market-based economy than Japan or Germany; as such, more small firms are listed on the stock market in the U.K. than in the other two countries. This size difference is also present in the data on total capital.

There is a substantial difference in the leverage ratios of the firms in the three countries. Consistent with Rajan and Zingales (1995), German firms have the lowest leverage ratios (median of 12.9 percent in 1992 and 14.3 percent in 1994) and Japanese firms have the highest debt levels (median of 29.2 percent in both years). We also report statistics on profitability and investment for the firms in our sample.<sup>5</sup> For Germany and the U.K., profitability is computed as operating income, before depreciation, divided by sales. For Japan, we lack specific data on depreciation so it cannot be separated from operating income in this computation. Firms in the U.K. are more profitable than German or Japanese firms. We hypothesize that part of this difference can be explained by differences in accounting rules and differences in the industry composition of the sample.

We also compare the characteristics of diversified and single-segment firms in the three countries (not reported in a table). There are no differences in leverage between single-segment firms and diversified firms for the three countries, which differs from Berger and Ofek (1995) who find that multi-segment firms in the U.S. have slightly more debt. It is therefore unlikely that these firms diversified to capture increased debt tax shields.<sup>6</sup> Profitability and capital spending are also similar between the two groups of firms in the three countries. Consistent with Berger and Ofek's (1995) U.S. results, we find that diversified companies are much larger than single-segment firms.

### B. Valuation Methodology

To investigate whether diversified firms are valued differently from single-segment firms, we employ the valuation methodology proposed by Berger and Ofek (1995). Berger and Ofek develop a method based on the ratio of total capital to three accounting items: sales, assets, and earnings. Each segment of a diversified firm is assigned the valuation ratio of the median of the single-segment firms that operate in the same industry. The imputed values of all the segments of a company are then summed to compute the imputed value of that company. The natural logarithm of the ratio of the

<sup>5</sup> We do not report capital expenditures for Japan because they are unavailable in the database for most companies.

<sup>6</sup> We examine whether there is a tax advantage to debt financing in all three countries using the Price Waterhouse *Doing Business in Germany, Japan, and U.K.* guides. The tax advantage is strongest in Japan, where there is double taxation of equity income, and capital gains are taxable. The U.K. has a partial imputation system, but there is still a tax advantage to debt financing, especially because capital gains are also taxable. Germany has a complete imputation system, but there remains a small tax advantage to debt financing because of trade taxes levied on corporations by local authorities (see also Rajan and Zingales (1995)).



actual to imputed market value is called the excess value of the firm, and it is used to determine whether diversified firms are trading at a discount or a premium. Our approach is similar, with the following two exceptions.

First, we only employ market-to-sales ratios since we lack segment data on earnings and assets for our sample. Second, to compute industry ratios, Berger and Ofek (1995) use the narrowest SIC grouping that includes at least five single-segment companies. We define industry at the two-digit SIC code level whenever there are other two-digit firms available. In a limited number of cases, we encounter diversified firms that operate in segments for which single-segment firm medians are not available. In these instances, we employ the median market-to-sales ratio of broad industry groups, based on the classification by Campbell (1996).<sup>7</sup> Our results remain unchanged when we exclude these firms from our analysis.

To facilitate comparison with Berger and Ofek (1995), we also eliminate any company whose imputed value is four times as large or as small as its actual value.

## II. Valuation Results

In addition to making industry adjustments as suggested in the previous section, it is also important to control for a number of other factors related to a firm's market-to-sales ratio (see Lang and Stulz (1994) and Berger and Ofek (1995)). Other potential determinants of the market-to-sales ratio are firm size, profitability, growth opportunities, and other intangible assets. We control for several of these characteristics in a regression framework. In particular, we estimate the following cross-sectional regression model for the three countries:

$$\begin{aligned} \text{Excess value} = & a + b_1 (\text{Diversification dummy}) + b_2 (\text{Log assets}) \\ & + b_3 (\text{Operating income/Sales}) \\ & + b_4 (\text{Capital expenditures/Sales}) + e. \end{aligned} \quad (1)$$

<sup>7</sup> For example, SIC codes 34, 35, and 38 are classified together in the capital goods industry.

In 1992 (1994), the diversified firms in Germany operate in 163 (219) segments in total. On average, each segment is matched with 6.4 (7.2) single-segment firms. Forty-one (40) percent of the segments are matched with five or more single-segment firms. We lack single-segment firms, and therefore use broad industry groups to match 12.3 (6.4) percent of these segments.

In 1992 (1994), the diversified firms in Japan operate in 773 (727) segments in total. On average, each segment is matched with 30.2 (25.3) single-segment firms. Ninety-three (94) percent of the segments are matched with five or more single-segment firms. We lack single-segment firms for one (zero) percent of the segments and therefore use broad industry groups in these cases.

In 1992 (1994), the diversified firms in the U.K. operate in 412 (295) segments in total. On average, each segment is matched with 7.6 (6.4) single-segment firms. Seventy-eight (65) percent of the segments are matched with five or more single-segment firms. We lack single-segment firms for 1.7 (2.4) percent of the segments, and therefore use broad industry groups in these cases.



Excess value has been defined previously. The ratio of operating income and sales is employed as a proxy for profitability, and the ratio of capital expenditures and sales is a proxy for growth opportunities. Unfortunately, we cannot include capital expenditures as an independent variable for Japan, because this data item is only available for a few Japanese companies on *Worldscope*. The diversification dummy in the above regression captures the difference in valuation between single-segment and diversified firms after controlling for the other factors.

Table III contains the results. The diversification discount in Germany is insignificant for both years: It is 1.1 percent for 1992 (*p*-value of 0.87) and 5.7 percent for 1994 (*p*-value of 0.44). This is very different from the U.S. evidence, presented by Lang and Stulz (1994) and Berger and Ofek (1995), who find evidence of a significant discount of about 15 percent. However, the large standard errors on the coefficients in our models suggest that they are measured imprecisely.

Excess value is negatively related to firm size in Germany. Lang and Stulz (1994) also find a negative relation between firm size and firm value for U.S. companies, whereas Berger and Ofek (1995) find a positive relation. Profitability and investment spending are positively related to excess value, as expected, but the coefficients are only significant in 1992. The inconsistency in the effect of the control variables across years is somewhat disturbing. In particular, the effect of size on excess value is significantly more negative in 1994 than in 1992 (*p*-value = 0.03), while the effect of capital expenditures is significantly more positive in 1992 (*p*-value = 0.01). Further investigation reveals that the significant difference in the effect of capital expenditures on value is caused by an outlier.<sup>8</sup> A closer look at the difference in the effect of size between the two years reveals that the small coefficient on size for 1992 is caused by a few small firms with low excess values. If we focus on firms with assets above \$50 million, the negative effect of size increases in 1992, and the difference in the effect of size between the two years is no longer significant. We also believe that inferences made without size controls could be misleading because, in 1994, size has a significant negative effect on the excess value of single-segment firms (*p*-value = 0.00) and of multiple-segment firms (*p*-value = 0.09), and the effect is not significantly different for both groups. We further examine the effect of size controls on our results in the next section, where we analyze whether the findings reported in Table III are different when we subdivide the sample according to firm size.

The regression results for Japan indicate a discount of about 8.3 percent in 1992 and 10 percent in 1994. The relation between profitability and excess value is highly significant, both statistically and economically. Excess value and size are not significantly related.

<sup>8</sup> One German firm in 1994 has a ratio of capital expenditures-to-sales of 1.33. Removing this company from the analysis does not affect the other results reported in the paper.

**Table III**  
**Regression Models of Excess Value on a Diversification**  
**Dummy and Control Variables for 1992 and 1994**

The following regression model is estimated for each country and each year:

$$\begin{aligned} \text{Excess value} = & a + b_1(\text{diversification dummy}) + b_2 (\ln \text{assets}) \\ & + b_3 (\text{operating income-to-sales}) \\ & + b_4 (\text{capital expenditures-to-sales}) + e. \end{aligned}$$

Excess value is defined as the natural logarithm of the ratio of a firm's actual market-to-sales ratio to its imputed market-to-sales ratio. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The *p*-value of the *t*-test of equality of the coefficient to zero is reported in parentheses. Data on capital expenditures are not available for Japan.

| Variable                      | Germany          | Japan            | United Kingdom   |
|-------------------------------|------------------|------------------|------------------|
| 1992 regressions              |                  |                  |                  |
| Intercept                     | -0.148<br>(0.56) | -0.137<br>(0.52) | -0.568<br>(0.00) |
| Diversification dummy         | -0.011<br>(0.87) | -0.083<br>(0.01) | -0.155<br>(0.01) |
| Log of total assets           | -0.007<br>(0.72) | -0.004<br>(0.74) | 0.036<br>(0.03)  |
| Operating income-to-sales     | 1.130<br>(0.02)  | 3.484<br>(0.00)  | 1.273<br>(0.00)  |
| Capital expenditures-to-sales | 1.642<br>(0.00)  | —                | 0.024<br>(0.91)  |
| Adjusted $R^2$                | 0.11             | 0.14             | 0.10             |
| Number of observations        | 158              | 763              | 377              |
| 1994 regressions              |                  |                  |                  |
| Intercept                     | 0.349<br>(0.01)  | 0.265<br>(0.23)  | -0.256<br>(0.00) |
| Diversification dummy         | -0.057<br>(0.44) | -0.100<br>(0.00) | -0.154<br>(0.02) |
| Log of total assets           | -0.066<br>(0.00) | -0.017<br>(0.17) | 0.047<br>(0.00)  |
| Operating income-to-sales     | 0.268<br>(0.48)  | 1.499<br>(0.00)  | 0.137<br>(0.25)  |
| Capital expenditures-to-sales | 0.308<br>(0.35)  | —                | 0.188<br>(0.30)  |
| Adjusted $R^2$                | 0.05             | 0.03             | 0.03             |
| Number of observations        | 219              | 761              | 305              |

For the United Kingdom, the diversification discount is virtually identical in both years at 15.5 percent. Just as in Germany, the coefficients on profitability and capital spending are positive, but only profitability has a significant effect in 1992. It is also interesting to note that firm size has a positive effect on firm value in the U.K. for both years.

Overall, these results indicate that there are differences in the valuation of diversified firms across the three countries. After controlling for other determinants of excess value, we do not find a significant discount for Germany, but the effect is not estimated very precisely. There is a discount of approximately 10 percent in Japan. This is smaller than the 15 percent documented in the United States by Berger and Ofek (1995), but it is still substantial. The discount in the U.K. is about 15 percent, which is basically the same as the U.S. discount. It is possible, however, that these differences are caused by differences in sample composition across countries; and the lack of consistency of the effect of size across countries suggests that further inquiries into the effect of size on excess value are warranted. We perform these tests in the following section.

### **III. Robustness Tests**

The results reported in Table III suggest that diversified firms trade at less of a discount in Germany and Japan than in the United States. One issue of concern is whether these findings can be caused by differences in the accounting treatment of the revenues of subsidiaries. All of the U.K. firms in our sample present consolidated financial statements, but approximately one-quarter of the Japanese firms and 15 percent of the German firms do not. This inconsistency in the preparation of financial statements could potentially bias our results. Specifically, firms that do not present consolidated financial statements have inflated market-to-sales ratios, because the reported sales figure does not include subsidiary sales. If there are systematic differences between the accounting practices adopted by single-segment and multisegment firms, they may induce the results reported in the previous section. To verify whether this is a problem, we remove all firms from the sample that do not report consolidated financial statements (see Rajan and Zingales (1995)), and repeat our analyses. The results are very similar to those reported in the previous section.

Another possibility is that our findings may be caused by differences in our implementation of the Berger and Ofek (1995) procedure, and not by actual differences in the discount across countries. As we discuss previously, to cope with the smaller size of our samples we modify the Berger and Ofek methodology, which may reduce the precision of our estimates and bias the coefficients. Additionally, the industry composition of the firms in the three countries differs from the industry composition of U.S. firms. To properly determine whether our findings are actually different from U.S. results, we need to document what the diversification discount would look like in the United States using the sample size and industry composition of the firms in our three countries. We use simulation analysis to accomplish this. In particular, we employ the following procedure, using Germany in 1994 as an example:

- (a) We gather data on the universe of all (U.S.) firms listed on the COMPUSTAT Business Segment database at the end of 1994.

- (b) We exclude all firms with segments in the financial or services industries.
- (c) We gather a random sample of 81 single-segment firms with the same industry distribution as the single-segment firms in Germany.
- (d) We gather a random sample of 146 diversified firms whose primary industry (largest in terms of sales) is the same as that of the German diversified firms.
- (e) Using these samples, we compute excess values and estimate a cross-sectional regression of excess values on a diversification dummy and control variables (size, profitability, investment), as in Table III. The coefficient on the diversification dummy captures the diversification discount for a sample of U.S. firms that mimics the distribution for Germany.
- (f) We repeat steps (c) through (e) 5,000 times.

To determine whether our findings for Germany are significantly different from those for the United States, we employ the empirical distribution obtained in this procedure. We repeat this simulation process on the U.S. data using the respective industry compositions of Japan and the U.K. in 1994, and for all three countries using 1992 data. We compare the simulation results to the U.S. discount using the full sample in both years, and applying the exact procedure followed by Berger and Ofek (1995).

The diversification discount for Germany (as documented in Table III) is 1.1 percent in 1992. The average U.S. simulated discount using the German sample composition is 21.3 percent, and 99 percent of all simulated discounts are larger than the 1.1 percent discount documented in Table III. This implies that the German discount is significantly smaller than the U.S. discount at the two percent level (after doubling the significance level).<sup>9</sup> For 1994, the average U.S. simulated discount using the German sample composition is 14.1 percent, and 85 percent of all simulated discounts are larger than the 5.7 percent discount documented in Table III. When we mimic the Berger and Ofek (1995) procedure, we find a U.S. discount of 14 percent in 1994 and 12.5 percent in 1992, based on a regression model of excess value on a diversification dummy and control variables. Thus, the fact that the U.S. simulated discount is larger than the full-sample discount in 1992 suggests that the sample selection procedure or the industry composition affects the measured discount. Nevertheless, we can say that the difference in valuation of U.S. and German diversified firms is significant in 1992, but not in 1994.

For Japan, we report a discount of 8.3 percent in 1992 and 10 percent in 1994 (see Table III). This compares to an average simulated discount using U.S. data of 23.3 percent in 1992 and 19.8 percent in 1994. This suggests that the discount in Japan is smaller than in the United States. The differ-

<sup>9</sup> We double the significance level to obtain the equivalent of a two-tailed test. For example, if 50 percent of all simulated discounts are larger than the actual discounts, and 50 percent are smaller, this suggests that both are essentially equal. In that case we would report a *p*-value of 1.00, after doubling the significance level.

ence is significant at the one percent level in 1992 and at the four percent level in 1994, based on the fraction of simulated U.S. discounts smaller than the measured Japanese discount (and after doubling the significance level).

The diversification discount for the U.K. is 15.5 percent in 1992 and 15.4 percent in 1994 (Table III). Using U.S. data and the U.K. sample composition, the average simulated discount is 20.3 percent in 1992 and 16.3 percent in 1994. This indicates that the discount in the U.K. is somewhat smaller than in the United States. The difference between the two countries is not significant, however. The *p*-values of the pseudo-significance test based on the simulations are 0.49 for 1992 and 0.92 for 1994.

Another reason for concern is that the effect of firm size on excess value (reported in Table III) is not consistent across countries. The effect is negative and significant in Germany (in 1994), negative and insignificant in Japan, and positive and significant in the U.K. This leads to the question of whether the diversification discount is affected by firm size. To answer this question, we reestimate our regression models, but include a dummy variable if a firm is larger than the median firm, and an interaction term between the size dummy and the diversification dummy.

Two interesting findings emerge (not reported in a table). First, across the three countries, 10 of the 12 groups (two size groups in three countries for both years) show a discount. Thus, there is little evidence of value-enhancing diversification, even within size groups. Second, only for Germany in 1994 is there a significant difference between the two size groups: a 20.7 percent discount for large firms, but a 12.2 percent premium for small firms. These results suggest that there may be a size effect in the diversification discount for Germany in 1994. This contrasts with the United States, where Berger and Ofek (1995) find a significantly negative coefficient on diversification for all size quartiles. As it turns out, for Germany, size is correlated with some of the corporate governance variables we examine in the next section. We therefore defer this discussion until we have presented those findings.<sup>10</sup>

Overall, our results support the conjecture that there are differences in the valuation of diversified firms across countries. In Japan, we find a significantly lower discount than in the United States. In Germany, the discount is also lower for both years, and it is never significantly different from zero. However, because the sample size is smaller, the discount in Germany is only significantly different from the U.S. discount in 1992. This does not imply that single-segment firms are not affected by agency problems in these countries. However, to the extent that diversification exacerbates the agency problem (or is an outcome of agency problems), our results suggest that diversification is less of a problem for shareholders in Japan (and possibly in Germany) than in the United States or the U.K. Of course, the notion that agency costs are lower in Germany and Japan is by no means universally embraced by academics and professionals; Allen (1996) summarizes and dis-

<sup>10</sup> We have also constructed excess values using only the larger half of the single-segment firms and only the smaller half of the single-segment firms. The excess values are similar to those constructed based on the full sample of single-segment firms.

cusses the conflicting views for Japan. Furthermore, the evidence does not address causality—that is, it is unclear whether firms are undervalued because they diversified or whether undervalued single-segment firms are more likely to diversify. We do not address that question in this paper.

To further explore the relation between the diversification discount and a country's institutional environment, we examine next the governance structure of our sample firms.

#### IV. Corporate Governance and the Costs and Benefits of Diversification

In this section, we investigate whether ownership structure and industrial group membership (for Japan) affect the costs of diversification. Part of this analysis is similar in spirit to that of Denis, Denis, and Sarin (1997) who examine the relation between ownership structure, firm value, and diversification for all *Value Line* firms at the end of 1984. They find that diversified firms have lower insider and blockholder ownership, but the relation between ownership structure and the valuation discount associated with diversification is weak. We perform similar tests for the firms in our sample, but gather more extensive ownership data and focus our analysis on specific differences in corporate governance among the three countries. To keep the data collection process manageable, we limit ourselves in this analysis to the 1994 sample.<sup>11</sup>

##### A. Ownership Data

Ownership data for Germany and the U.K. are gathered from Worldscope, which provides information on ownership by all individuals and organizations who own at least five percent of the stock of the firm.<sup>12</sup> Japanese ownership data are obtained from *The Japan Company Handbook*, a publication that lists the ten largest shareholders for each corporation, which includes many shareholders with stakes below five percent. This is particularly important for ownership by banks in Japan, who are restricted from holding more than five percent of the shares of a company.

For Japanese companies, we gather additional information on keiretsu membership from *Industrial Groupings in Japan*, a publication that contains detailed information on the 39 largest industrial groups. In particular, it contains comprehensive information on all of the cross-shareholdings within the groups. Conveniently, the publication also provides a ranking from one to four indicating how closely a particular company is linked to a keiretsu,

<sup>11</sup> For Germany, we gather 1992 ownership data as well to perform a robustness check on the 1994 findings, which turn out to be fragile.

<sup>12</sup> The minimum filing requirement for Germany is actually 25 percent, but companies often provide details on smaller shareholdings as well; to make sure that voluntary ownership disclosures do not bias our findings, we verify that our results remain unchanged when we focus exclusively on required disclosures (not reported in a table).



with four being a very strong link and a one being a very weak link. Companies not listed in this publication are classified as not being part of a keiretsu.

Table IV summarizes the ownership structure for the firms in our sample. Whenever an ownership position overlaps with the list of officers and directors provided by Worldscope, we classify the position as insider ownership; individual block ownership comprises ownership by persons not on that list. Ownership is further divided into bank ownership and other institutional investor ownership (pension funds, mutual funds, and insurance companies).<sup>13</sup> We also list in parentheses the fraction of firms for which ownership in each category is equal to five percent or more. There are substantial differences in ownership structure across the three countries. Ownership is much more concentrated in Germany than in Japan or the United Kingdom. Corporations are the dominant owner in Germany, controlling approximately 40 percent, on average, of the equity of other firms. Sixty-five percent of all firms have corporate ownership in excess of five percent. Insider ownership is also substantial at 11.9 percent. Corporations are also the dominant owner in Japan, but they own only half the shares of their German counterparts. Insider ownership is modest at 3.5 percent and bank ownership stands at 12.3 percent. Institutions other than banks are the largest shareholders in the U.K., with 17.2 percent of the stock, followed by insiders with 7.8 percent and other individuals with three percent.<sup>14</sup>

### *B. Does Ownership Structure Explain the Diversification Discount?*

In this section, we investigate whether the magnitude of the diversification discount depends on the ownership structure of the corporations. If diversification is less costly in Japan (and perhaps in Germany) than in the United States and the U.K. because ownership is more concentrated in these countries, then we should find a relation between the benefits of diversification and ownership concentration within each country. The main problem with this analysis is that ownership structure may be correlated with firm size, and given the evidence we presented previously on the relation between firm size and the diversification discount in Germany (in 1994), it may be impossible to disentangle these effects. We do find a significant negative correlation between insider ownership and size in all three countries. Although size is negatively correlated with corporate ownership in Germany and Japan, all of the correlations are relatively small, which may alleviate the problem.

To determine whether the diversification discount is related to ownership concentration, we estimate regression models similar to the ones reported in Table III, but we now include ownership variables and interaction terms between the ownership variables and the diversification dummy. To measure own-

<sup>13</sup> This classification is based on the *Euromoney Bank Atlas* (1995), *Thompson's Bank Directory* (1995, 1996), and several publications of Euromoney that contain lists of the world's largest institutional investors.

<sup>14</sup> Actual institutional ownership is likely to be much higher in the U.K., since only institutions that meet the five percent reporting cutoff are included in this sample.



Table IV  
Ownership Structure for 1994—Summary Statistics

Ownership data are obtained from Worldscope for Germany and the United Kingdom. Worldscope only identifies shareholders with ownership stakes in excess of 5 percent. Ownership data for Japan are obtained from the *Japan Company Handbook*, which lists the largest 10 shareholders for each company. In parentheses next to the mean, we list the percentage of firms for which ownership in each category is equal to five percent or more. The keiretsu rating is based on the association reported in *Industrial Groupings in Japan*. A rating of zero indicates that the firm is not associated with a keiretsu. For firms associated with a keiretsu, the ratings range from one to four depending on the strength of the relation.

|                                 | Germany     |        | Japan       |        | United Kingdom |        |
|---------------------------------|-------------|--------|-------------|--------|----------------|--------|
|                                 | Mean        | Median | Mean        | Median | Mean           | Median |
| Insider ownership               | 11.93 (22%) | 0.00   | 3.53 (20%)  | 0.00   | 7.80 (29%)     | 0.00   |
| Individual block ownership      | 5.10 (15%)  | 0.00   | 1.29 (9%)   | 0.00   | 3.06 (22%)     | 0.00   |
| Corporate block ownership       | 39.93 (65%) | 33.00  | 20.13 (68%) | 13.40  | 0.38 (2%)      | 0.00   |
| Bank ownership                  | 4.31 (20%)  | 0.00   | 12.30 (85%) | 12.90  | 0.91 (5%)      | 0.00   |
| Ownership by other institutions | 1.62 (9%)   | 0.00   | 6.02 (49%)  | 4.70   | 17.16 (74%)    | 14.23  |
| Keiretsu rating                 | —           | —      | 1.00        | 0.00   | —              | —      |

ership, we construct indicator variables that we set equal to one when ownership in a particular category equals or exceeds the five percent threshold, and zero otherwise. We use indicator variables for three reasons. First, *Worldscope* only provides information for ownership at or above this level. Since we do not know the level of ownership for stakes lower than five percent (for Germany and the U.K.), it is not clear that a continuous variable would better capture the ownership effect. Second, the impact of ownership on the value of diversification is not necessarily linear. Third, using dummy variables eases the interpretation of the coefficients. Our results are similar when we include the level of ownership, albeit they are only significant for 1992.

Table V contains the results.<sup>15</sup> For Germany, we find that there is a diversification discount of 27.8 percent when insiders control less than five percent of the company. When insiders control at least five percent of the company, the effect of diversification on excess value increases by 49 percentage points. However, insider ownership, by itself, has an insignificant negative effect on firm value. As a result, firms that are diversified and have insider ownership above five percent are actually valued at a small premium of 3.7 percent ( $-27.8 - 17.6 + 49.1$ ), which is not significantly different from zero ( $p$ -value = 0.89). The difference between the 27.8 percent discount and the 3.7 percent premium is significant at the five percent level. Corporate ownership and bank ownership do not significantly affect the valuation of diversified firms in Germany.

These results also shed light on our earlier finding that the diversification discount in Germany is significant only for large companies. Insider ownership is negatively correlated with size and positively correlated with the valuation effects of diversification. Thus, the ownership result could be driven just by size. When we estimate separate regressions for large and small firms, however, we continue to find that insider ownership enhances the value of diversification, although this effect is significant only for small firms (not reported in a table). This suggests that the ownership result is rather fragile.<sup>16</sup> Unfortunately, gathering a larger sample is not an option since we have gathered all available data for German companies. We therefore gather ownership data for 1992 as well, and repeat our analyses. For the sake of brevity, these results are not reported in a table. The regression models are consistent with the findings for 1994: Insider ownership significantly reduces the diversification discount. These results continue to be significant for subsets of small and large firms.

<sup>15</sup> Germany has 17 diversified firms with insider ownership of five percent or more, 45 diversified firms with corporate ownership of five percent or more, and 19 diversified firms with bank ownership of five percent or more. Japan has 41 diversified firms with insider ownership of five percent or more, 184 diversified firms with corporate ownership of five percent or more, and 182 diversified firms with bank ownership of five percent or more. The United Kingdom has 21 diversified firms with insider ownership of five percent or more, one diversified firm with corporate ownership of five percent or more, and six diversified firms with bank ownership of five percent or more.

<sup>16</sup> Of course, dividing the sample into two subsets reduces the power of the tests.

**Table V**  
**Regression Models of Excess Value on a Diversification Dummy,**  
**Ownership Structure, and Control Variables for 1994**

Regression model:

$$\begin{aligned} \text{Excess value} = & a + b_1 (\text{diversification dummy}) + b_2 (\ln \text{ assets}) + b_3 (\text{operating income-to-sales}) \\ & + b_4 (\text{capital expenditures-to-sales}) + b_5 (\text{insider ownership} \geq 5\%) \\ & + b_6 (\text{corporate ownership} \geq 5\%) \\ & + b_7 (\text{bank ownership} \geq 5\%) + b_8 (\text{insider ownership} \geq 5\% * \text{div. dummy}) \\ & + b_9 (\text{corporate ownership} \geq 5\% * \text{div. dummy}) \\ & + b_{10} (\text{bank ownership} \geq 5\% * \text{div. dummy}) + e. \end{aligned}$$

Excess value is defined as the natural logarithm of the ratio of a firm's actual market-to-sales ratio to its imputed market-to-sales ratio. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The *p*-value of the *t*-test of equality of the coefficient to zero is reported in parentheses.

| Variable                                   | Germany          | Japan            | United Kingdom   |
|--|------------------|------------------|------------------|
| Intercept                                  | 0.547<br>(0.00)  | 0.414<br>(0.11)  | -0.340<br>(0.00) |
| Diversification dummy                      | -0.278<br>(0.08) | -0.103<br>(0.40) | -0.106<br>(0.16) |
| Log of total assets                        | -0.063<br>(0.00) | -0.022<br>(0.10) | 0.055<br>(0.03)  |
| Operating income-to-sales                  | 0.153<br>(0.69)  | 1.448<br>(0.00)  | 0.143<br>(0.23)  |
| Capital expenditures-to-sales              | 0.193<br>(0.57)  | —                | 0.193<br>(0.28)  |
| Insider ownership $\geq 5\%$               | -0.176<br>(0.14) | 0.011<br>(0.84)  | 0.116<br>(0.16)  |
| Corporate ownership $\geq 5\%$             | -0.251<br>(0.02) | -0.094<br>(0.07) | -0.269<br>(0.21) |
| Bank ownership $\geq 5\%$                  | 0.062<br>(0.60)  | 0.011<br>(0.86)  | 0.329<br>(0.05)  |
| Diversified * insider ownership $\geq 5\%$ | 0.491<br>(0.01)  | 0.037<br>(0.69)  | -0.076<br>(0.60) |
| Diversified * corp. ownership $\geq 5\%$   | 0.180<br>(0.27)  | 0.035<br>(0.64)  | 0.133<br>(0.81)  |
| Diversified * bank ownership $\geq 5\%$    | -0.116<br>(0.45) | 0.032<br>(0.77)  | -0.567<br>(0.04) |
| Adjusted $R^2$                             | 0.09             | 0.03             | 0.04             |
| Number of observations                     | 219              | 761              | 305              |

For Japan, we find no evidence that ownership structure affects the diversification discount. The coefficients on all the interactions between the ownership dummies and the diversification dummy are insignificant. The

results for the U.K. are similar to those for Japan regarding insider ownership and corporate ownership: The diversification discount is not materially affected by either group of ownership. The results on bank ownership in the U.K. are quite intriguing. We find a large discount for diversified firms that are owned by banks, but a large premium on bank ownership by itself. These findings are difficult to reconcile with any of the arguments on the costs and benefits of concentrated ownership. Further examination, however, reveals that only 16 firms in our sample (four percent of the sample) have bank ownership in excess of five percent, and only six of these firms are diversified. We are therefore reluctant to draw any conclusions from this result.

To summarize, the results in Table V indicate that ownership structure affects the benefits of diversification in Germany, but not in Japan nor the U.K. We find a relation only for insider ownership. Ownership by other corporations or by banks is not related to the valuation effect of diversification. Either these parties are not effective monitors, or they derive private benefits from diversification. For example, diversification may enhance the ability of a corporation to repay its bank debt, which is beneficial for the bank shareholders who may also be major lenders to the corporation.

If insider ownership is important in Germany, why do we not find a similar effect in Japan or the U.K.? One possibility is that the dummy variables do not capture the cross-sectional variation in insider ownership across the three countries. Insider ownership is higher in Germany and in the U.K. than in Japan, and it is possible that insider ownership is only effective when it reaches a threshold higher than five percent. However, redefining all the ownership dummies at the 10 percent level does not alter the statistical significance of the results for all three countries. When we use 25 percent level dummies in Japan, we find a significant effect of insider ownership on diversified firm value. The coefficient on the ownership-diversification interaction dummy is 0.38 ( $p$ -value = 0.06). However, only eight diversified firms have insider ownership equal to or above the 25 percent threshold. For the U.K., we can only use 25 percent dummies for insider ownership since only one diversified firm has bank ownership in excess of 25 percent and no firms have corporate ownership in excess of 25 percent. We do not find a significant ownership effect. For Germany, we obtain equivalent results if we define the ownership dummies at the 25 percent level.

Another explanation for the lack of consistency of the effect of insider ownership concentration on the diversification discount is that, in both Japan and the U.K., diversification and insider ownership are significantly correlated. The correlation for Japan is  $-0.11$  ( $p$ -value = 0.00), and for the U.K. it is  $-0.17$  ( $p$ -value = 0.00). In Germany, this correlation is small and insignificant ( $\rho = -0.03$ ,  $p$ -value = 0.66). Thus, insider ownership may actually be beneficial to the extent that companies with high insider ownership are less likely to be diversified. Denis et al. (1997) reach the same conclusion in their study of U.S. firms.

*C. Diversification and the Keiretsu Structure*

Another feature of the Japanese corporate governance system that deserves further examination in light of the significant diversification discount reported in previous sections is the keiretsu system. As mentioned previously, keiretsu organizations are industrial groups with strong cross-shareholdings often organized around a main bank.<sup>17</sup>

One of the alleged benefits of corporate diversification is that it allows for the creation of an internal capital market which functions more efficiently than the external market. To the extent that the industrial group achieves these internal capital market benefits, there is no need for an individual firm member to mimic the process. Li and Li (1996) argue that “*keiretsu* organizations are not fundamentally different from conglomerates (p. 703)” and Milgrom and Roberts (1992) contend that “member companies will support one another in projects that make economic sense (p. 580).”<sup>18</sup> Of course, keiretsu organizations cannot be expected to create an internal capital market that is as integrated as that of a conglomerate. It is unlikely that cash flows of companies with poor investment opportunities flow freely to those companies with excellent opportunities. However, Hoshi, Kashyap, and Scharfstein (1991) document that the sensitivity of investment to cash flow is smaller for group member firms, which suggests that these firms are less financially constrained. Moreover, Hoshi, Kashyap, and Scharfstein (1990) find that group firms (and firms with close bank ties) are able to invest more after the onset of financial distress. This indicates that member firms do have better access to financial resources. If that is the case, then there is less need for diversification. Agency motives may, therefore, be more prominent in member firms that decide to diversify than in nonmember firms that decide to diversify. If this is true, we should observe a larger diversification discount for group firms. It is also possible that the banks who provide the financing to the group firms encourage diversification because it reduces the riskiness of their loans. Alternatively, group members may be under closer scrutiny from the other companies in the group, and these firms may not be allowed to diversify unless it is beneficial to shareholders (or, at the very least, not harmful to shareholders). If this enhanced monitoring by group members is not accomplished through increased share ownership, it is not reflected in our ownership results, and therefore not captured by the models reported in Section IV.B.

To examine these conjectures, we include the keiretsu ratings discussed in Section IV.A in our regression models and interact our diversification measures with these ratings. We report the results in Table VI. We do not include ownership interactions in our models because they are insignificant in

<sup>17</sup> See Khanna and Palepu (1998) for empirical evidence on the costs and benefits of industrial group structures in India.

<sup>18</sup> Reitman (1997) discusses how Toyota's suppliers, who are also members of its industrial group, immediately retooled to start making brake valves when the primary supplier, Aisin Seiki Co., experienced a major fire.

**Table VI**  
**The Effect of Keiretsu Membership on the Value**  
**of Diversification in Japan in 1994**

Two regression models are estimated:

- (1) Excess value =  $a + b_1$  (diversification dummy) +  $b_2$  (ln assets)  
+  $b_3$  (operating income-to-sales)  
+  $b_4$  (keiretsu dummy) +  $b_5$  (keiretsu dummy \* diversification dummy) +  $e$ .
- (2) Excess value =  $a + b_1$  (diversification dummy) +  $b_2$  (ln assets)  
+  $b_3$  (operating income-to-sales)  
+  $\sum b_j$  (keiretsu rating  $j$  dummy)  
+  $\sum b_{j+3}$  (keiretsu rating  $j$  dummy \* diversification dummy) +  $e$ .

Excess value is defined as the natural logarithm of the ratio of a firm's actual market-to-sales ratio to its imputed market-to-sales ratio. Diversification dummy is an indicator variable set equal to one if the firm operates in two or more segments where a segment is defined as a two-digit SIC code industry. The keiretsu rating is based on the association reported in *Industrial Groupings in Japan*. A rating of zero indicates that the firm is not associated with a keiretsu. For firms associated with a keiretsu, the ratings range from one to four depending on the strength of the relation, where four corresponds to the strongest relation. The  $p$ -value of the  $t$ -test of equality of the coefficient to zero is reported in parentheses.

| Variable                             | (1)              | (2)              |
|--------------------------------------|------------------|------------------|
| Intercept                            | 0.159<br>(0.47)  | 0.107<br>(0.63)  |
| Diversification dummy                | -0.048<br>(0.31) | -0.048<br>(0.31) |
| Log of total assets                  | -0.010<br>(0.42) | -0.007<br>(0.58) |
| Operating income-to-sales            | 1.411<br>(0.00)  | 1.397<br>(0.00)  |
| Keiretsu member                      | -0.050<br>(0.27) |                  |
| Keiretsu rating 1                    |                  | -0.027<br>(0.74) |
| Keiretsu rating 2                    |                  | -0.049<br>(0.46) |
| Keiretsu rating 3 or 4               |                  | -0.066<br>(0.29) |
| Diversified * keiretsu member        | -0.101<br>(0.16) |                  |
| Diversified * keiretsu rating 1      |                  | 0.019<br>(0.88)  |
| Diversified * keiretsu rating 2      |                  | -0.040<br>(0.71) |
| Diversified * keiretsu rating 3 or 4 |                  | -0.182<br>(0.04) |
| Adjusted $R^2$                       | 0.04             | 0.05             |
| Number of observations               |                  | 761              |

Table V.<sup>19</sup> The first model includes a dummy equal to one if a firm belongs to a keiretsu (322 firms) and the interaction between this dummy and the diversification dummy (146 firms). The model indicates that diversification is not harmful to shareholder wealth unless the firm belongs to a keiretsu, in which case the diversification discount increases by 10 percentage points. Diversified firms that belong to a keiretsu trade at a discount of 19.9 percent ( $-0.048 - 0.050 - 0.101$ ), which is highly significant ( $p$ -value = 0.00). However, the interaction between the diversification dummy and the keiretsu dummy is insignificant.

To further enhance our understanding of this issue, we measure the effect of keiretsu influence on the diversification discount in the second model. In this specification we include three keiretsu dummies, one each for the first two levels of association and one where we combine levels three and four, and three keiretsu-diversification interaction dummies.<sup>20</sup> The model shows that a relatively weak relation with a keiretsu (levels one and two) does not affect the valuation of diversified firms. Similarly, there is no significant discount for nonmember firms. However, a strong keiretsu affiliation (levels three and four) increases the value loss to diversification by about 18 percentage points ( $p$ -value = 0.04) to a total discount of 30 percent ( $-0.048 - 0.066 - 0.182$ ). We also verify that our results remain unchanged if we focus on the eight largest horizontal groups.

These findings are consistent with the notion that agency problems are a stronger motive for diversification in companies associated with industrial groups. Of course, this argument does not explain why the other group members are not effective in restraining unjustified diversification, and they cast doubt on the keiretsu structure as an effective monitoring mechanism. Since many of the keiretsu organizations are formed around a main bank, our results are also consistent with recent work that emphasizes the costs of banking relationships (Rajan (1992), Weinstein and Yafeh (1998)).

## VI. Conclusion

This paper contains three major results. First, we find significant differences in the valuation of diversified firms in Germany, Japan, and the U.K. After making appropriate industry adjustments, we find no evidence of a diversification discount in Germany. There is a discount of approximately 10 percent in Japan, and of 15 percent in the United Kingdom. The discount in Japan is smaller than in the United States, but this is not the case for the U.K. The valuation of diversified firms in Germany is significantly different from the valuation for similar U.S. firms in one of the two years in our

<sup>19</sup> The effect of keiretsu membership on the diversification discount is not related to ownership structure. However, ownership structure and keiretsu membership are correlated. Keiretsu members have lower insider ownership, higher corporate ownership, and higher bank ownership.

<sup>20</sup> There are 69 firms with keiretsu rating one, 31 of which are diversified; there are 104 firms with keiretsu rating two, 40 of which are diversified; and there are 149 firms with keiretsu rating three and four, 75 of which are diversified.



sample. Second, we explore whether the differences in the discount are caused by differences in ownership structure. We find that concentrated ownership in the hands of insiders enhances the valuation of diversified firms in Germany, but it does not affect the valuation in Japan or the United Kingdom. Third, for Japan we find that the diversification discount is only present for firms with a strong association to keiretsu organizations.

Taken together, this evidence supports the notion that differences in corporate governance matter; however, a number of questions and issues remain. First, if insider ownership concentration attenuates the diversification discount in Germany, why does it not have the same effect in Japan or in the U.K.? There may be counteracting forces that we have not identified in this paper. Second, if diversified keiretsu members trade at a substantial discount, why does the group structure allow it to happen? It is possible that these firms already performed poorly before they diversified (see Lang and Stulz (1994) and Hyland (1996) who report U.S. evidence in support of this conjecture, and Servaes (1996) who does not).<sup>21</sup> Alternatively, group membership may insulate the firm from control pressures. These questions warrant further investigation.

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<sup>21</sup> See also Matsusaka (1995) and Bianco (1997) for theories unrelated to agency costs explaining why diversified firms may trade at a discount.

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