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ABSTRACT

This paper examines the effect of geographic and industrial diversification on firm value for a sample of over 20,000 firm-year observations of U.S. corporations from 1987-1993. Our multivariate tests indicate the average value of a firm with international operations is 2.2% higher than comparable domestic single activity firms, while the average value of a firm with activities in multiple industrial segments is 5.4% lower than a portfolio of comparable focused domestic firms in similar activities. More importantly, we demonstrate that failure to control simultaneously for both dimensions of diversification results in over-estimation of the negative value impact of industrial diversification, but has little impact on estimates of the positive value impact of geographic diversification.

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I. Introduction

The past few years have seen a growing interest by the academic and business community on the relation between firm value and corporate diversification. Research in this area has focused on the impact on firm value of diversification across different lines of business (industrial diversification). While economic theory suggests both positive and negative impacts of industrial diversification on firm value, the empirical evidence indicates a substantial negative effect on shareholder wealth associated with a firm's diversification across multiple activities. This has led to a generalization that diversification within a firm is bad for shareholder wealth. However, in addition to diversifying across lines of business, firms can also diversify their activities across national boundaries (geographic diversification). Economic theory provides several arguments suggesting that geographic diversification will be beneficial to firm value, and existing empirical evidence suggests that corporate geographic diversification is generally beneficial to firm value. However, in contrast to the robust empirical evidence on industrial diversification there exist no estimates of the value implication of geographic diversification from a large cross section of firms.

There is also the problem that despite the obvious correspondence of these two lines of research on corporate diversification, they have developed largely independently from one another. Thus studies on the value implications of industrial diversification have generally failed to consider the implications of geographic diversification on their results, while the studies on the value implications of geographic diversification have generally failed to consider effects of industrial diversification on their results. Such failure to account for the possibility of the other form of diversification leads to the possibility of an omitted variable problem and limits inferences about the value impact of each form of diversification in isolation.

In this paper we link these two branches of the corporate diversification literature. By considering both forms of diversification simultaneously, we obtain independent measures of the average value impact of both geographic and industrial diversification and avoid the potential omitted variable problem arising from the failure to control for the other form of diversification. In addition, as a significant number of firms are diversified in both dimensions, we consider the interaction effect between industrial and geographic diversification on firm value. This

conditional analysis allows us to estimate a "pure" value impact of each form of diversification from firms whose value is not influenced by the alternative form of diversification, as well as examine the value implications for firms that diversify in both dimensions.

Our study considers the value impacts of both dimensions of corporate diversification using a sample of over 20,000 firm-year observations from 1987-1993. We use both industry and geographic segment data provided under the disclosure requirements of Statement of Financial Accounting Standard No. 14 to identify the diversification characteristics of 4,722 different U.S. firms. Univariate tests consider average differences across firms for three common value measures: an excess market value to sales ratio, a market-to-book value of assets ratio, and a price to earnings ratio. Industrial diversification is associated with reductions in all of the value measures, while geographic diversification is associated with their increase. In all cases, the size of both the geographic and industrial diversification effects are economically large, averaging around 5-7% of firm value in the predicted direction. Similar results are found for tests on a value measure that adjusts for both industry effects and industry composition of industrial diversified firms.

We conduct multivariate tests on the industry-adjusted value measures to control for other sources of value identified in previous studies from both the industrial and geographic diversification literature. After controlling for these characteristics, we find that geographically diversified firms are on average 2.2% of total capital more valuable than comparable single activity domestic firms. This estimate is consistent with, though slightly larger than, estimates of the value of corporate geographic diversification that can be drawn indirectly from previous studies. The same multivariate regressions indicate that industrially diversified firms are on average 5.4% of total capital less valuable than a comparable portfolio of single industry domestic firms. While this finding is qualitative consistent with previous results, it is significantly smaller in magnitude. A primary reason for this difference comes from controlling simultaneously for both forms of diversification. Further tests show that failure to account for geographic diversification results in estimates of the negative impact of industrial diversification that are 40% larger than our estimate. In contrast, failure to account for industrial diversification has a negligible impact on the estimate of geographic diversification.

Additional tests of the value impact of each form of diversification conditional on the other, reveal that the average value impacts of geographic diversification are roughly similar across the extent of industrial diversification. The value impacts of industrial diversification, however, appear to be conditional on geographic diversification. Multinational firms suffer less for industrial diversification than do domestic firms.

The rest of the paper is organized as follows. Section 2 reviews the theory and value implications behind both forms of diversification. Section 3 discusses the sample selection and data sources. Section 4 considers the valuation effects of geographic and industrial diversification using three conventional market valuation measures. Section 5 considers similar univariate tests based upon an industry-adjusted value measure that controls for possible industry effects. Section 6 examines multivariate tests based upon this industry-adjusted value measure, examines the omitted variable problem and considers conditional tests of the diversification effects. Section 7 summarizes and concludes.

II. Theory and Literature Review

II.A.1. Theory Behind Value Implications of Geographic Diversification

The concept that international diversification enhances firm value has its roots in the literature on the sources of foreign direct investment (FDI). The literature suggests that firms invest abroad to exploit firm-specific assets, the markets for which are imperfect so that the assets cannot be sold for their internal value (see, e.g., Caves (1971) and Hymer (1976)). Instead the firm internalizes the market imperfections for obtaining rents on these assets and transfers the assets abroad within an internal market. By internalizing the market imperfections, the firm is able to extract above market returns on its specific assets which, in efficient financial markets, are capitalized into a higher value of the firm. The specific source of these gains to firm value from growing geographically comes from expanding firm-specific assets and potential economies of scale for the use of these assets. Economies of scale in specific assets such as marketing and research and development suggest that their value to the firm increases with the size of the firm's activities in areas that utilize these specific assets.

Value creation from geographic diversity can also be extended by considering the operational flexibility associated with a multinational corporate system (Kogut (1983)). In light of the increasing uncertainty of the international environment, a geographically diversified network gives the firm the opportunity to *exploit* market

conditions. For example, a multinational production network allows shifting of production in response to the large scale changes in relative prices that can occur internationally. This cost structure flexibility helps reduce the average marginal cost of world-wide production relative to that of purely domestic production resulting in higher profit margins or greater market share. A similar argument holds for average output prices across foreign markets when demand shocks are not perfectly correlated. Conditional on the costs of creating and maintaining a corporate network that is diversified across geographic-based uncertainties, such a network can add additional value to the firm because of ability to exploit a larger variety of market conditions.

On top of these issues, a geographically diversified firm will be more valuable because of its ability to arbitrage institutional restrictions such as tax codes and financial restrictions (both formal and informal see, e.g., Errunza and Senbet (1981,84)). Having operations in multiple geographic locations, the multinational firm creates an additional string of options which it can exercise upon occurrence of particular outcomes, such as the location to declare profits, the appropriate market to concentrate market power and the low-cost location to raise capital.[1] For example, differences in taxation across countries give rise to the possibility for the firm to transfer some profits and/or losses within the firm to locations where they are tax advantaged (see, e.g., Hines and Rice (1990)). All of these capabilities to make value-maximizing conditional decisions increase the expected cash flows from geographically diversified firms relative to domestic firms.

Finally, value from corporate geographic diversification can come directly from the investor. To an investor, multinational firms represent a geographically diversified portfolio—a claim on a collection of profits streams from various areas of the world. To the extent that investors value global diversification (beyond domestic diversification) and direct geographic diversification by investors is expensive, investors should be willing to pay a premium for shares of geographically diversified firms for providing them this service. This premium will increase the value of the geographically diversified firms relative to that of domestic firms.

Thus there are a variety of ways that geographic diversification can enhance the value of a firm. To the extent that the characteristics noted above and flexibility options are available uniquely to geographically diversified

[1] The assumption of a value advantage in raising capital implicitly assumes that capital markets are not perfectly integrated (i.e., that the location of a security issue impacts its price).

firms and cannot be otherwise acquired by investors, the value of the geographically diversified firms should be increased to reflect these benefits. This suggests that geographically diversified firms should be more valuable than domestic firms. Moreover, the incremental value of the geographically diversified firm should be increasing with the ownership of these characteristics and flexibility options, the dispersion of its functional operations across different regulatory and consumer markets as well as the volatility of the environment in which it operates (see Kogut and Kulatilaka (1994)).

Corporate geographic diversification could also reduce firm value. While shareholders seek value maximization as a goal of corporate decisions, managers objectives may differ. In particular, managers seek to act in their own self interest, which at times may be at the expense of shareholders interests. A large literature has developed discussing the negative value implications of shareholders' difficulties in monitoring the activities of managers.[2] These problems increase as the organization becomes more complex. Multinational firms, due to their operations in different locations, are arguably more complex than domestic organizations. Moreover, a common solution to this incentive problem is to give managers equity stakes in their firms. This makes managers concerned about firms' specific risk in addition to systematic risk. As a result managers may favor geographic diversification because it reduces the firm-specific risks they face, even if it results in lower shareholder value. Thus despite the benefits from above, it is possible that extensive geographic diversification may result in a negative impact of firm value.

II.A.2. Empirical Evidence on Value of Geographic Diversification

Early empirical work on the effect of geographic diversification on firms looked market-based financial performance and found mixed results on the benefit of geographic diversification. For example, Mikhail and Shawky (1979) find that multinational firms earn excess returns using Jensen's risk adjustment measure. However, Brewer (1981) reports no difference between multinationals and purely domestic firms in terms of risk adjusted performance while Fatemi (1984) reports no difference in the rates of return to investors for multinational versus domestic firms, except in some sub-samples when the multinational firms under perform domestic firms. Michel and Shaked (1986) find that multinational firms have inferior risk-adjusted performance than domestic firms.

Errunza and Senbet (1981, 1984) first recognized that with efficient capital markets, all benefits of geographic diversification will be discounted into the current value of the firm. Errunza and Senbet (1981) examine an excess-value measure for a small sample of multinational firms from 1968-1977 and find the value measure increasing with the degree of international activity.[3] Errunza and Senbet (1984) re-examine the question on a larger set of multinational firms from 1971-1978, this time controlling for the effect of firm size and using different measures of international activity. They continue to find a positive association between the excess value measure for two of their three proxies for international involvement. Kim and Lyn (1986) extend these findings by controlling for advertising expenditures, R&D expenditures, prior sales growth and industry concentration. They continue to find that the degree of international involvement remains positively related to market value despite significant positive relations between the value measure and both advertising and R&D. However, no relation is found when the number of foreign affiliates is used as the proxy for international involvement. Like the Errunza and Senbet findings these results suggest that among multinational firms value is increasing with the degree of international involvement. However these studies suffer from the drawback that by examining only multinational firms they cannot provide an estimate of the value benefit of geographic diversification because they do not include domestic firms in their samples.

Morck and Yeung (1991) examine the value impact of various measures of geographic diversification for 1,644 U.S. domestic and multinational firms for the year 1978. They show that geographic diversification is positively related to the level of a firm's intangible assets measured using Tobin's q (defined as the market value of the firm over the market value of its tangible assets). Their results suggest that even upon controlling for other sources of intangible assets such as R&D and advertising expenditures, q is positively correlated with the number of foreign subsidiaries or countries in which the firm operates. Although, they never directly measure the economic size of the value impact of geographic diversification, their results suggest that a foreign subsidiary increases q by 0.333% of the tangible assets and operations in a foreign country increase q by 0.550% of tangible assets. Based upon the mean number of foreign subsidiaries and foreign countries for the multinational firms in their sample, one

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[2] See, e.g., Jensen and Meckling (1976).

[3] They also show that the relation between excess market value and international involvement was stronger during a sub-sample characterized by barriers to capital flows compared to the more liberal financial rules of the later part of the sample, suggesting

can back-out a value to geographic diversification of about 1.30% of tangible assets.[4]

While Morck and Yeung (1990) directly control for possible industry effects by using dummy variables at the *primary* three-digit SIC code level, they do not control for industrial diversification. Substantial evidence suggests that industrial diversification is associated with significantly negative value impact for firms (see Lang and Stulz (1994) and Berger and Ofek (1995) discussed below). Given this fact, studies of the value implications of geographic diversification that do not take industrial diversification into account suffer from a potentially serious omitted variable problem. If (as it turns out to be the case) industrially diversified firms are more prevalent among multinational firms than domestic firms then the value estimates of geographic diversification will be biased downward. This possibility implies that any attempt to measure the value impact of geographic diversification needs to take into account industrial diversification.

II.B. Theory and Evidence on Value Implications of Industrial Diversification

Firms can expand their activities by becoming conglomerates and diversifying their interests across different lines of business. Early research argues industrial diversification should add value because of benefits associated with size and economies of scope/scale and the associated pooling of risks. For example, Weston (1970) argues that resource allocation is more efficient in internal capital markets than external capital markets and that diversified firms, by virtue of their larger size, allocate resources more efficiently. More recently, Stulz (1990) points out that larger internal capital markets work to reduce the underinvestment problem described by Myers (1977). Other benefits of diversification across businesses comes from the cross-guarantee with respect to debt financing. Firms with multiple activities that are imperfectly correlated will have more stable cash flows and thus obtain better external financing deals. This can lead to higher leverage and greater use of tax shields that can add to shareholder value. Consistent with this view, early empirical studies suggest that the performance of conglomerate

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that multinationals are valuable when they provide below market cost diversification services.

[4] Related lines of research considers the stock-price reaction around foreign acquisitions and the valuation of foreign income. Event studies of foreign acquisitions (e.g., Fatemi (1984), Doukas and Travlos (1988), Morck and Yeung (1992), Markides and Ittner (1994), and Desai, Dukas, and Fatemi (1996)) generally find small positive abnormal returns around the date of an international expansion, but size of the effect is small when compared to other corporate events. While these studies suggest some value benefit to foreign acquisitions, they do not address the total value impact of geographic diversification. Other research on the valuation of foreign income (Bodnar and Weintrop (1997)) demonstrates that foreign income changes are associated with larger impacts in firm value than domestic income changes, and the difference in is related to the relative growth opportunities of foreign versus domestic operations.

firms dominate portfolios of single activity firms (see, Copeland and Weston (1979) for a review).

Later theoretical thinking on industrial diversification came to focus on its costs. Arguments of over-investment, cross-subsidization, and information asymmetry arose to explain the growing empirical evidence that domestic acquisitions on average create no value for the acquiring firm (see, e.g., Jensen and Ruback (1983)). Studies using data from the 1980's began revealing evidence of a small penalty to industrial diversification (see, e.g., Eckbo (1985), Morck, Schliefer, and Vishny (1990), and Kaplan and Weisbach (1992)).

Much of the research on the value of industrial diversification has focused on the post-event performance of acquisitions and divestitures. This literature generally suggests that unrelated acquisitions results in significant negative cumulative abnormal return over future years, whereas divestitures result in significant positive cumulative abnormal return over subsequent years (see, e.g., Aggrawal et al. (1992)). Other studies have considered the effects of industrial diversification on Tobin's q. Wernerfelt and Montgomery (1988) find a negative correlation between the degree of industrial diversification and Tobin's q. However, these studies do not directly measure the size of the negative wealth effect of industrial diversification.

Lang and Stulz (1994) demonstrate a negative relation between Tobin's q and industrial diversification on a large sample of firms from 1978 - 1990. They provide a comparison of the average q across industrially diversified and specialized firms. They estimate the mean Tobin's q of the specialized firms is nearly 40% higher than the sample average. Similar results occur when they adjust their measures for industrial composition. A more interpretable measurement of the overall value impact of industrial diversification is examined by Berger and Ofek (1995). Using a large sample of firms on the COMPUSTAT Industrial Segment (CIS) tape from 1986 - 91, they compare the market value of industrial diversified firms to a theoretical value measured as the sum of the imputed value of each industrial segment. The imputed value is determined from multipliers drawn from single activity firms in that industrial segment. They demonstrate that industrial diversification reduces firm value by 13% - 15% compared to the sum of the imputed market values of the individual industrial segments. They further demonstrate that this loss in value is related to problems of over-investment and cross-subsidization.

Neither Lang and Stulz (1994) nor Berger and Ofek (1995) consider geographic diversification in their analysis. Given the evidence from the geographic diversification literature that suggests a positive value impact of

geographic diversification, measures of the value impact of industrial diversification that do not control for geographic diversification potentially suffers from an omitted variables problem. As mentioned in the introduction, the impacts of these two dimensions of diversification have not been looked at simultaneously with respect to their impact on shareholder wealth for such a large sample.[5] This is despite the fact that research has shown that similar characteristics are correlated with both geographic and industrial diversification (see, Wolf (1977)).

III. Sample Selection and Data Sources

Our sample selection procedure begins by identifying all firms on COMPUSTAT's Primary, Secondary, and Tertiary and Full-Coverage files that are incorporated in the United States and are also covered by COMPUSTAT's Business Information (CBI) file.[6] We identify the degree of a firm's of geographic and industrial diversification from the CBI Geographic Segment and Industrial Segment files. These segmental data are generated as part of the disclosure requirements mandated under the Statement of Financial Accounting Standards No. 14 (Financial Accounting Standards Board 1976). This statement requires firms to report material segment information such as operations in different four-digit standard industrial classification (SIC) code industries, operations in foreign locations, export sales, and major customers for fiscal years ending after December 15, 1977.

The COMPUSTAT Geographic Segment (CGS) database reports the geographic segment information for COMPUSTAT firms for up to seven years. If a firm has more than 10 percent of its total sales, income or assets, from operations outside of the U.S., it is required to provide data on unaffiliated revenues, some measure of profitability, and identifiable assets. We used the CGS tape to identify firms as being geographically diversified. Firms that report any revenue, income, or asset data for a non-U.S. segment are treated as being geographically diversified for that particular year. Firms that report no non-U.S. segment information are treated as being domestic

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[5] There are a few papers that consider the two forms of diversification simultaneously, but all look at performance rather than value. Miller and Pras (1980) look at 246 U.S. multinationals (MNCs) over 3 years in the 1960's and find that profit stability depends on geographic diversification but not on industrial diversification. Buhner (1987) looks at 40 German MNCs from 1966- 81 and finds performance positively related to geographic diversification but negatively related to industrial diversification. Kim, Hwang, and Burgers (1989) look at 62 U.S. MNCs and find that geographic diversification moderates the negative relation between industrial diversification and performance. Finally, Sambharya (1995), using 53 MNCs from 1985 finds an inverse relation between geographic and industrial diversification, and that individually nether is related to financial performance but when combined they lead to a substantial increase in firm performance.

[6] We require data on earnings, sales, assets, share price, number of shares outstanding at the end of the year, book value of common equity, total liabilities, and assets. Incorporation in the U.S. is determined by a zero value for the FINC variable.

firms, despite the possibility that they may have up to 10% of their activities abroad or be actively involved in exporting their domestically produced product. COMPUSTAT interprets the geographic segments disclosed by the firms and classifies them into one of seven predefined major geographic regions (i.e., Europe, Asia, Africa, Pacific, South America, Middle East, North America, or Other Foreign). In addition, the tape also indicates activities in certain individual countries as reported in the annual report. We count up the total number of these regions/countries as a measure of the intensity of the firm's geographic diversification but use only a zero-one indicator variable for geographic diversification in our analysis.[7,8]

The COMPUSTAT Industrial Segment (CIS) database reports the line of business information for COMPUSTAT firms for up to seven years. If an industry segment makes up more than 10 percent of the firm's total revenues, operating income, or identifiable assets, the firm is required to provide data on five variables by each industry segment: net sales, operating income, depreciation, capital expenditures, and identifiable assets. The basis of segmentation is left to the discretion of the firm, but is generally recorded at the 4-digit standard industrial classification (SIC) code level. Any firm reporting values in more than one industrial segment on the CIS tape is considered to be multiactivity. We also count up the number of different four-digit SIC code industries the firm reports as a measure of the intensity of the firm's industrial diversification but use only a zero-one indicator variable for industrial diversification in our analysis.[9]

To prevent potential distortions from small firms, we delete all firm-year observations with total sales less than $20 million. This leaves us with a total of 4,722 unique firms and 24,522 firm-year observations over the period 1987 - 1993. Segmenting the observations by both forms of diversification results in four separate groups: single activity domestic firms, single activity multinational firms, multiactivity domestic firms, and multiactivity

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7 COMPUSTAT arbitrarily restricts the number of foreign segments that it reports to four plus a sum of the total foreign information. Thus there may be an aggregation of segment of data on the tape beyond that observed in the firms reporting under FASB No. 14. In addition, COMPUSTAT only provides codes for 10 foreign countries with heavy U.S. foreign investment. As a result, this count of the combination of regions and country codes as a measure of the extent of geographic diversification should be interpreted with some caution.

8 Note that we are only interested in determining the mean value impact of diversification. Clearly there will be variation around these means within each group. Such variation in the value effects around the mean is left for future work. For current work examining the source of the variation of these value effects around the mean, see Boston Consulting Group (1997) for industrial diversification and Allen and Pantzalis (1996) for geographic diversification.

9 As a result of the greater number of reporting possibilities on the CIS tape for industrial segments as compared to the geographic segments, these measures of the intensity of industrial and geographic diversification are not necessarily comparable.

multinational firms. Descriptive statistics for these four groups are displayed in Table 1. The first group are the 2,712 single activity domestic firms generating 11,058 firm-year observations (45.1% of the total sample). This group acts as a benchmark to calibrate the value impacts of the two types of diversification. These firms are the smallest firms in the sample measured on either assets, sales or capital. They have a mean (median) asset size of $736 ($101) million. The second group consists 1,197 single segment multinational firms with 5,173 firm-year observations (21.0%). These firms report activities in a mean (median) of 3.86 (3) different geographic locations. As a group, they are larger than the single activity domestic firms along all size dimensions, with a mean (median) asset size of $941 ($160) million. The third group consists of 996 multiactivity domestic firms generating 4,322 firm-year observations (17.7%). These firms report activities in a mean (median) of 2.91 (3) different 4-digit SIC code industries. They tend to be more than twice as large as the benchmark firms in all dimensions with a mean (median) assets of $1,815 ($240) million. The fourth group consists of 784 multiactivity multinational firms with 3,969 firm-year observations (16.2%). These firms report activities in a mean (median) of 3.18 (3) industrial segments and 4.66 (4) geographic locations. These firms are the largest firms in the entire sample along all dimensions, with a mean (median) asset size of $5,009 ($787) million.

IV. Empirical Tests of the Value of Diversification

Univariate Tests

To measure the value impacts of diversification we employ several value measures. Because any value measure is subject to some criticism and to determine the robustness of our findings, we begin our analysis with three conventional measures of firm value.

EV = (market value of common equity - book value of common equity) / total sales.

MTB = total market value of assets over the total book value of assets.

P/E = price per common share over earnings per common share.

The first measure, EV, is the excess market value of common equity normalized by sales. It is the

difference between the market value and book value of a firm's common equity at year-end divided by sales.[10] Thomadakis (1979) uses this measure to study the impacts of market structure on firm value and it is similar to the measure used in studies by Errunza and Senbet (1981, 1984) and Kim and Lyn (1986). The second measure, MTB, is the total market value of the firm to the book value of the firm. It is defined as the sum of the market value of equity plus the book value of liabilities and preferred stock over the book value of the firm's total assets. This measure is similar in nature to the Tobin's q measure used by Morck and Yeung (1990).[11] The third measure, P/E, is the standard end of year price per common share over earnings per common share. It is defined as the market price of a share over primary earnings per share. As a result of the possible measurement problems with these measures, we will consider all three of them jointly when drawing inferences about the value of diversification for our univariate tests.

We calculate these three ratios for all the firms in our sample. Table 2 reports summary statistics and associated tests for these ratios for the four groups of firms: single activity domestic firms, single activity multinational firms, multiactivity domestic firms and multiactivity multinational firms. Due to the potential existence of outliers and their influence on parametric measures such as means and standard deviations, we choose to examine the distribution of these ratios using non-parametric tests. Each square of this 2x2 breakdown reports the 25th percentile (Q1), the median and the 75th percentile (Q3) of the distribution. Also reported are the number of observations in each groups with sufficient data to calculate the value measure and the mean number of industrial segments (iseg) and the mean number of geographic (domestic plus foreign) segments (gseg) for the firms in that quadrant. The difference between the median value measures and the associated median test statistic as well as a test statistic for a Wilcoxon rank sum test for a differences in the distribution of value measures in each row or column are displayed in a box corresponding to each row and column. Tests of the difference between the distributions of the quadrants on the main diagonal are shown in the box corresponding to the main diagonal. The

10 All the market value measures are based upon prices as of the end of the firm's fiscal year. While this can create a distortion due to changes in market level over time and not all firms having the same fiscal year, the use of calendar-yearend prices would be non-synchronous with the firms accounting data release. Using calendar-year end prices results in virtually identical results.

11 This measure differs from a true measure of Tobin's q in that it uses book values for liabilities and normalizes by the book value of tangible assets. Tobin's q generally involves estimating both the market value of a firm's liabilities as well as the market value (replacement cost) of the tangible assets. Morck and Yeung report that they obtain very similar results to those reported in their study when they use a simple market-to-book ratio instead of their measure of Tobin's q.

statistics for both tests are Z-scores which are distributed as unit normal distributions under the standard null hypothesis.

Panel A of Table 2 displays the results for the EV measure of value. The results indicate two distinct patterns: 1) moving from the domestic column to the multinational column always results in a increase the value measure independent of the industrial diversification, and 2) moving from the single activity row to the multiactivity row always results in a decrease of the value measure, independent of the geographic diversification. Test statistics reveal that the differences in both the medians and the entire distributions are always statistically significant when moving to the right or down in the table.

More specifically, for geographic diversification the median single segment multinational firm has an EV measure of 0.310 which is more than 33% larger than the EV measure for the median single segment domestic firm of 0.232. This is a measure of the independent effect of geographic diversification, with no influence of industrial diversification. These results suggest that the median single-activity multinational firm has an excess market value of equity that is 7.8% (of firm sales) *higher* than that of the median single segment domestic firm. The independent value impact of industrial diversification can similarly be measured by comparing the single activity domestic firms to the multiactivity domestic firms. The median multiactivity domestic firm has an EV measure of only 0.162, which is about 30% lower than the median single segment domestic firm. This translates into the median multiactivity firms having an excess market value of equity that is 7% (of firm sales) *lower* than that of the median single segment domestic firm. Thus these two effects are both statistically and economically significant and of the same order of magnitude, though opposite in direction.[12]

We now isolate the decomposition into both dimensions. This can be done by comparing the value measures of the single segment domestic firms to the value measures of the multiactivity multinational firms. Given that geographic diversification suggests higher value and industrial diversification suggests lower value, whether the value measures of multiactivity multinational firms are larger or smaller than single segment domestic firms acts as

12 While the geographically diversified firms appears to be large, one must keep in mind that the single-activity multinational firms appear to be more geographically diversified than the domestic multiactivity firms are industrially diversified.

a rough test of which effect is larger.[13] The median EV measure for the multiactivity-multinational firms is 0.198, which is 14.6% lower than the median EV measure for the single activity domestic firms. The test statistics in the lower right-hand corner reveal that both the median and the entire distribution of EV measures are significantly lower for the multiactivity-multinational firms. This is true despite the degree of geographic diversification appears larger than the degree of industrial diversification within the multiactivity multinational firms.[14]

Panel B of Table 2 displays results for the MTB value measure. Once again moving to the right within the table is associated with increases in the value measures while moving down in the table is associated with decreases in the value measures. All of the differences between rows and columns are statistically significant at very high levels for both the median and the distribution tests. From the MTB measure, the "pure" value impact of geographic diversification between the median firms is 11% of book value. The "pure" value effect of industrial diversification is a comparable -9.3% of book value. Once again the two independent effects are on the same order of magnitude, but in the opposite direction. The negative industrial diversification effect appears to dominate as the multiactivity multinational firms have significant lower MTBs than the single segment domestic firms.

Panel C of Table 2 displays the results for the P/E measure. As with the previous two panels it is always the case that moving to the right within the table is associated with increases in the value measures while moving down in the table is associated with decreases in the value measures. These differences are also all significant, although the Z-scores are generally not as high reflecting the wider distributions of P/E ratios. For the P/E measure, the "pure" value impact of geographic diversification for the median firm turns out to be a 15.8% higher price per dollar of earnings. The estimate of the "pure" value-effect of industrial diversification on the median firms is a -6.6% lower price per dollar of earnings. For the P/E ratio the beneficial effect of geographic diversification appears to be larger than the negative effect of industrial diversification when comparing the value impacts along the main diagonal. Unlike the previous two panels, Panel C shows that the P/E measures of the multiactivity multinational firms are significantly higher than the single activity domestic firms for both medians and full the distributions.

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13 This "test" assumes away the possibility of interaction effects between industrial and geographic diversification. This interaction effect will be considered in Section 6.

14 Note that these measures of diversification are not necessarily comparable.

Tests, not reported, on this effect on a year-by-year basis tell a similar story. For the seven years of observations, the difference between the median value measures of the single activity multinationals and the single activity domestic firms is positive and significant at the 10% level in all cases, except for the 1989 and 1991 for the EV measure when it is positive but not significant. In all cases the Wilcoxon test between these two groups is significant at the 10% level. In all seven years the difference between the medians and the distributions of the multiactivity domestic and the single activity domestics is always negative and significant at the 10% level for each of the value measures.

V. Adjusted Value Measure

A significant drawback to the univariate results discussed above is that we have not controlled for possible industry effects across the different groups of firms. This failure is problematic for two reasons. First, it is likely that that there are standard industry effects in the three measures we have used to determine the value impact of diversification. If, as is likely, there are differences in concentrations of firms in particular industries across the four groups of firms based upon industrial and geographic diversification, then our estimates of the value impacts of diversification may be influenced by such industry-based differences. Second is the fact that the industry effects are difficult to untangle for the industrially diversified firms, which are like portfolios of different industry activities. One common approach is to regress the value measures on industry dummy variables. However, this becomes problematic for industrial segmented firms as it does not allow for the appropriate weighting of any particular industry influence.

To control simultaneously for both of these industry problems and allow for examination of the value of geographic diversification, we use an approach similar to that of Berger and Ofek (1995) and calculate an adjusted value measure that creates a comparable domestic baseline value for all firms based upon their industrial composition and eliminates problems with differences in industry concentration across the four groups of firms.

V.A. Adjustment Method

The approach of this adjustment is to create a relative value measure whereby the market value of the firm is compared to an imputed market value of each industrial activity within the firm. This imputed value for each

industrial activity is based upon representative market capitalization-to-sales ratios for domestic single-activity firms (see Appendix for additional details). To be included in this analysis, we require that each firm-year observation have data on total market capitalization (defined as the sum of the market value of common equity plus the book value of preferred stock and total liabilities) and have industrial segment sales that reconcile with total sales (the sum of segment sales must be within ±1% of consolidated sales).[15] To determine the representative value of activity in a particular industry, we identify the median market capitalization-to-sales ratio for all single activity domestic firms in a particular industry. In obtaining the multiplier for a particular industry, we use the narrowest SIC code grouping that includes at least five single activity domestic firms in that industry. Using this algorithm, 30% of the industrial multiples are taken from 4-digit SIC groupings, 43% from 3-digit SIC groupings, and the remaining from 2-digit SIC groupings.[16]

Each representative industry multipliers is applied to a firm's annual reported sales in that industry to create an imputed market value for that activity. For single industry firms, this product becomes the imputed value of the firm, and for multiactivity firms the imputed value for each industrial segment of the firm is summed to generate an imputed value of the firm. By definition, this imputed value represents an estimate of the value of the firm as if all of its activities were ***stand-alone domestic*** activities. The natural log of the ratio of the firm's actual total market value to this imputed value becomes our industry-adjusted measure of excess value. When this ratio is greater than zero, it indicates that diversification, either geographic or industrial, has enhanced the market- value of the firm relative to its representative stand-alone domestic baseline. When this ratio is less than zero, it indicates that diversification, either geographic or industrial, has reduced the market value of the firm relative to the its representative stand-alone domestic baseline.[17]

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15 For data reasons, sales are the best segment information to form cross-firm comparisons on. Under SFAS No. 14, segment sales are required to be fully allocated on both an industrial and geographic basis. The same is not true for segment assets, where firms often report a large common allocation. Segment income suffers from the fact that firms are allowed to choose the definition of income they report for their segments, making comparisons across firms difficult.

16 An insufficient number of single activity domestic firms were available, even at the 2 digit SIC level, for industries 01 (Agriculture Production) and 21 (Tobacco Products). As a result, 1207 firm-year observations with activities in these industries are dropped from this part of the analysis.

17 For a discussion of potential benefits and drawbacks to this approach, see Berger and Ofek (1995). The important difference between the their methodology and the one used in here is that we use the single segment domestic firms to draw the multipliers whereas they use all single segment firms to draw the multipliers. This is important as approximately one-third of the single industrial segment firms have international operations (and therefore higher value).

V.B. Results

These data requirements to calculate the adjusted value measure decrease of our sample to 19,809 firm-years observations. Of these observations, 9,266 (46.7%) are for single segment domestic firms, 4,589 (23.1%) are for single activity multinational firms, 3,092 (15.6%) are for multiactivity domestic firms, and 2,862 (14.4%) are for multiactivity multinational firms.

Table 3 displays the summary statistics for the distribution of adjusted value measure for the four groups of firms. In addition to the three quartiles, we also report the mean of these distributions. The same basic pattern found in all panels of Table 2 also appears for the adjusted value measure. Once again, moving to the right in the table is associated with increases in the value measures while moving down is associated with decreases in value measures. Except for the diagonals, all difference tests are statistically significant. With this industry-adjusted value measure we show that the value effects of industrial and geographic diversification shown in the previous section are not the results of industry effects or composition.

In Table 3 the effect of diversification on firm value can be assessed by examining the summary statistics of the value measures across each group of firms. By construction, the median excess value measure is zero for the single activity domestic firms; however, the mean for these firms is slightly positive, 0.0204 and significant at the 1 percent level suggesting a slight skew to the distribution.[18] The single activity multinational firms have a median value ratio of 0.0494 and a mean value ratio of 0.0614. Both of these values are significantly different from zero. These results suggest that, within an industry, geographic diversification increases total firm value by approximately five percent. A similar increase in value form geographic diversification is seen across the industrially diversified firms. The median multinational multiactivity firm has a value measure that is 0.0655 (0.0010 - (-0.0645)) larger than that of the median domestic multiactivity firm. The difference in mean value measures is 0.0724 (0.0047 - (-.0677)) and is statistically significant. These number suggest that geographic diversification increases the value of multiactivity firms by somewhere between 6 and 7 percent.[19]

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18 The positive mean suggests a slight positive skew to the distribution of market value to sales multipliers among the domestic single activity firms. This indicates that the parametric tests may be less appropriate than the non-parametric tests.

19 It is not surprising that this value is slightly larger than the single activity multinationals as the multiactivity multinationals are slightly more geographically diversified, with an average of 4.65 geographic segments compared to 3.88.

Industrially diversified firms with no geographic diversification influence display a median value measure of -0.0645 and a mean value measure of -0.0677. Both of these values are highly significant, and are consistent with (although smaller than) the findings of Lang and Stulz (1994) and Berger and Ofek (1995). These numbers suggest that combining different industrial activities with the domestic market results in a drop of total firm value by around 7 percent. This estimate of the loss of value from industrial diversification is corroborated by a similar difference in value measures between single activity multinationals and industrial diversified multinationals. The difference in median value measures is -0.0484 [0.0494 - 0.0010] and the difference in the mean value measure is 0.0567 [0.0614 - 0.0047]. These figure suggest a slightly smaller value impact of industrial diversification on the order of 5 percent.[20]

Two comparisons about the relative size of the diversification effects can be seen for the results in Table 3. First, comparing the single activity domestic firms with the multiactivity multinational firms along the main diagonal reveals that for firms that diversify in both dimensions, the value impacts basically offset. There is no statistical differences between the distribution of value measures for these two groups. Thus for the multiactivity multinationals the positive value effects of geographic diversification offset the negative value impact of industrial diversification. The table offers another method to test the relative size of the value effects of each form of diversification. We test whether the positive value impacts of geographic diversification on the single segment multinationals is equal to the negative value impacts of industrial diversification on the multiactivity domestic firms with the sign reversed. The results of tests of this hypothesis are shown in the bottom corner of the off-diagonal. Consistent with the main diagonal, one cannot reject that the value impacts of the two forms of diversification are equal and offsetting in the population of U.S. firms.

These results with the industry adjusted data are similar to the results from Table 2. Despite the industry adjustments to the value measures, geographically diversified firms are on average more valuable compared to their single activity domestic counterparts. The size of this effect is economically significant and comparable with the magnitude of the value effect of industrial diversification. Consistent with previous findings, the industrially

20 The smaller size of this estimate is predictable given the fact that industrially diversified multinationals are more geographically diversified than single activity multinationals.

diversified firms have significantly lower market value when compared to their single activity domestic counterparts. However, our estimate of the value effect of industrial diversification is only about two-thirds the size of the effect documented by Berger and Ofek (1995, Table 2, p.48) using the sales multiplier.

VI. Multivariate Tests

VI.A. Multivariate Regression Results

In this section we develop a multivariate regressions test of the value of corporate diversification to control for a variety of influences on firm value documented in both the geographic and industrial diversification literature. From the geographic diversification literature, Morck and Yeung (1990) provide a theoretical justification for controlling for R&D and advertising expenditures as proxies for firm specific assets that may lead to economic rents. They also argue for controlling for leverage as a proxy for any financing benefits of being multinational. From the industrial diversification literature, Berger and Ofek (1995) demonstrate the importance of controlling for measures of profitability, growth opportunities, and firm size as factors that could affect excess value and whose magnitudes are not fully determined by the form of diversification. Because we are interested in examining simultaneously the value impact of both geographic and industrial diversification, we control for all six of these factors. However, because we use the adjusted value measure from the previous section as the dependent variable, VM, we also measure the control variables as the deviation from the firms' domestic multiplier firm(s). Thus our corporate control variables are all measured relative to each firm's multiplier firm or weighted average multiplier firms that form the basis of the relative value measure. Our multivariate regression is:

$$VM = \alpha_0 + \gamma_1 \sum_{i=1988}^{1993} TD_i + \alpha_1 Geog + \alpha_2 Indust + \alpha_3 Size + \alpha_4 Leverage +$$
$$\alpha_5 EBIT/Sales + \alpha_6 Capex/Sales + \alpha_7 R\&D/Sales + \alpha_8 Adv/Sales + \varepsilon_i$$

where:

VM	is the adjusted value measure derived in the previous section;
Geog	is a indicator dummy set equal to one if the firm is geographically diversified and zero otherwise;
Indust	is an indicator dummy equal to one if the firm is industrially diversified and zero otherwise;
Size	is the log ratio of the firm's total sales to that of its multiplier firm(s);
Leverage	is the difference between the firm's debt/market value of total asset ratio and that of its multiplier firm(s);
EBIT/Sales	is the difference between the ratio of the firm's earnings before interest and taxes to its total sales

and that of its multiplier firm(s);

Capex/Sales is the difference between the firm's capital expenditures to sales ratio and that of its multiplier firm(s);

R&D/Sales is the difference between the firm's R&D expenditures to sales ratio and that of its multiplier firm(s);[21]

Adv/Sales is the difference between the firm's advertising expenditures to sales ratio and that of its multiplier firm(s).

Estimates from the multivariate regression and the associated White (1980) adjusted standard errors are displayed in Panel A of Table 4. For the sake of space, the time dummies results are not reported. Due to the more stringent data requirements for the control variables, the multivariate regression has only 17,951 firm-year observations. The results of the multivariate tests indicate the basic qualitative nature of the univariate tests persists; however, they reveal a different picture regarding the size of the average value impact of each form of diversification. The estimate of the coefficient on the dummy variable for industrial diversification is -0.0537 and is significant at the 1 percent level. The estimate of the coefficient on the dummy variable for geographic diversification is positive, 0.0220, and significant at the 1 percent level. This suggests that rather than being roughly the same order of magnitude as suggested by the univariate tests in Tables 2 and 3, the average negative effect of industrial diversification is between two and three times as large as the positive effect of geographic diversification once one controls for other possible influences on value.

The estimated on the control variables are generally consistent with intuition. High relative profitability (EBIT/Sales), R&D intensity (R&D/Sales), and investment opportunities (Capex/Sales) are all highly related to excess value. Consistent with other studies, relative firm size is also significantly related to positive excess value. Relative advertising intensity (Adv/Sales) is only weakly associated with excess value, while relative leverage (debt/market value of assets) shoes no significant relation. The explanatory power of the regression is very high given its size, with an adjusted R-squared of 18.52%.

The reason for the change in size of the relative value impacts of the two forms of diversification compared

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21 A problem with controlling for intangible assets using R&D and advertising arises in that a large percentage of firms do no report data for R&D or advertising expenditures. In most cases, COMPUSTAT reports a missing value for these data items. The reason for the missing data items are either that the firms does no R&D or advertising or that such expenditures are not material enough to be reported separately in the financial statements. Rather than drop observations with missing data, which would result in a drop of sample size by over 60%, we re-interpret the missing data for R&D and advertising expenditures as suggesting it is not material and recode it to be zero Note that missing data for R&D expenditures and advertising expenditures are much more frequent in the single activity domestic group of firms than in either of the other three groups.

to Table 3 can be seen in the strong positive relation between the value measure and firm size. Because multinational firms are on average much larger than domestic firms, some of the value benefit to being multinational in Table 3 is attributed to firm size in Table 4. However, the results still suggest that a geographically diversified firm is on average 2.2% of total market value of assets more valuable than a comparable activity domestic firm of the same size and leverage and with the same level of profitability, R&D and advertising expenditures.

Because of the pooled nature of the data set, there is the possibility that the standard errors may be understated due to cross sectional correlation among the residuals, resulting in inappropriate inferences about statistical significance.[22] To consider the impact this problem is having on our results, Panel B of Table 4 reports the means (and the associated standard errors of the mean) for the parameter estimates of the multivariate regression estimated cross-sectionally for each of seven years of data. The results are similar to those of Panel A. This suggests that our pooled results are not driven by and particular year nor is the statistical inference significantly affected by the possibility of cross sectional dependency in the residuals.

VI.B. Empirical Implications for Diversification Research

This section considers the implications of failing to consider simultaneously both forms of diversification when estimating the value impact of diversification. This analysis is important because the literatures looking at the value impact of diversification typically consider one dimension of diversification and it is useful to determine how such an omission affects the quantitative results. By reproducing results considering only a single dimension of diversification and comparing the results to Table 4, we can determine the impact of this omission on the size of the value impact.

To examine this aspect of the omitted variable problem, we re-calculate two new versions of the adjusted value measures. The first new adjusted value measure worries only about industrial diversification and completely ignores geographic diversification. Thus, we obtain representative value-to-sales multipliers from *all* single activity firms, not just domestic firms, and compute the value measure in the same fashion as discussed in Section V above

22 One benefit of a pooled data set over single year data set is that the pooled sample averages out exchange rate mis-alignments that can influence the relative valuation of multinational firms to domestic firms for any particular year.

based upon the reported sales in each industrial segment. The second new adjusted value measure worries only about geographic diversification and completely ignores industrial diversification. Thus, we obtain value-to-sale multipliers from the entire set of domestic firms (both single and multiactivity) for each industry, where multisegment firms are placed into industry groups purely on the basis on their *primary* SIC code reported in Compustat. The adjusted value measures are then calculated using the median values/sales multipliers from the domestic firms in each industry based upon the assumption that a firms total sales are in their primary SIC code industry.

There are two differences to notice between these new values measures and the value measure used in Table 3 and 4 that accounts for both forms of diversification. One difference is that the pooling of firms on the baseline side contaminates the multipliers used to determine the implicit value of the firms. In the new measure that ignores geographic diversification, some value/sales multipliers are drawn from single segment multinational firms, raising the implicit valuation of all firms with sales in that industry, and driving down the distribution of excess value measures among the multisegment firms. In the new measure that ignores industrial diversification, some of the multipliers are drawn from multisegment domestic firms, lowering the implicit value of firms listed in that industry and raising the distribution of excess value measures among the multinational firms. Thus this difference will have the tend to make the average value impact of industrial diversification more negative (in the first case) and the average value impact of geographic diversification more positive (in the second case).

The second difference works in the opposite direction. It concerns the pooling on firms on the testing side. For the measure that considers only industrial diversification, some of the industrially diversified firms are also multinational, which is likely to increase their value measures. This pooling of types will tend to make the impact of unconditional industrial diversification less negative. For the measure that considers only geographic diversification, some of the geographically diversified firms will also be industrially diversified, which is likely to decrease their value measures. This pooling of types will work to make the impact of unconditional geographic diversification less positive. The dominance of these two offsetting effects for the unconditional value impact of each for of diversification in isolation case can only be determined empirically.

Panel A of Table 5 displays the results of the multivariate regression for the value impact of industrial diversification using the new value measure that completely ignores geographic diversification.[23] The average value impact of industrial diversification is -0.0760, which is larger than the estimate of -0.0537 from Panel A of Table 4. The economic difference between these estimates is significance, suggesting a 42% overstatement of the negative value impact of industrial diversification due to the failure to control for geographic diversification.[24]

Panel B of Table 5 displays the results of the multivariate regression with the new value measure that completely ignores industrial diversification. The average value impact of geographic diversification is 0.0229 which is only trivially different than the estimate of 0.0220 for the value impact of geographic diversification from Table 4. Such a small and economically insignificant difference suggests that failure to control for industrial diversification has no real impact on the estimate of the average value impact of geographic diversification.

VI.C. Conditional Effects

In this section we consider whether any of the value impacts of diversification from Table 4 differ conditionally on the other form of diversification. In particular, we are interested in whether geographic diversification has a differential impact depending on whether the firm is industrially diversified or not and whether industrial diversification has a differential impact depending on whether the firm is geographically diversified or not.

To do this we re-run a similar multivariate regression as specified for the results in Table 4, first with just single segment firms, and then with just multisegment firms to consider differences in the value impact of geographic diversification conditional on industrial diversification. Then we run the multivariate regression on just domestic firms, and then again on just multinational firms to consider differences in the value impact of industrial diversification conditional on geographic diversification. One important difference for these tests is that we replace the indicator variable for geographic and industrial diversification in the regression with an intensity measure of diversification. This is because, as apparent from Table 1, the extent of geographic (industrial) diversification

23 To allow direct comparisons with Table 4, these regressions are run on exactly the same observations used in Table 4.

24 If we consider a similar multivariate regression as Berger and Ofek (1995, Table 3 p. 50, without taking relative control variables and omitting the control variables for leverage, R&D or advertising expenditures), the estimate on the industrial diversification dummy increases to -0.110, which is similar to their estimate of -0.144 for the sales multiplier measure.

conditional on industrial (geographic) diversification varies. The use of dummy variables in the conditional analysis would capture effects due to these differences in diversification intensity rather than true conditional differences. Thus we replace the indicator dummies of diversification with an intensity of diversification measure than is defined as one plus the natural logarithm of the total number of segments that Compustat reports (the variables defined as iseg and gseg in Tables 2 and 3).

Results of these conditional regression are reported in Table 6. Panel A contains the results for the tests of the value of geographic diversification conditional on industrial diversification. In the first regression, titled *Single-Activity Firms Only*, the slope coefficient on the geographic diversification intensity variable is 0.0180, and is significant at the 1 percent level. This estimate is not very different from the slope coefficient on the geographic diversification intensity variable in the second regression, titled *Multiactivity Firms Only*, of 0.0215, which is also significant at the 1 percent level. This suggests that the value impact of geographic diversification is relatively constant and independent of the extent of industrial diversification. It is interesting to note that the industrial diversification intensity estimate for the *Multiactivity Firms Only* regression is insignificantly different from zero suggesting that conditional on being multiactivity, the extent of industrial diversification is not related to firm value.

Panel B of Table 6 contains the results for the tests of the value of industrial diversification conditional on geographic diversification. In the first regression, titled *Domestic Firms Only,* the slope parameter on the industrial diversification intensity variable is -0.0741, and is significant at the 1 percent level. In contrast, the slope coefficient on the industrial diversification intensity variable in the second regression, titled *Multinational Firms Only*, is only -0.0547, and also significant at the 1 percent level. This difference is large as a percentage of the size of the estimates and suggests that industrial diversification has a smaller negative impact on value among multinational firms than among domestic firms. As expected, the estimate on the geographic diversification intensity variable in the *Multinational Firms Only* regression is positive and significant.

The results in Table 6 are suggestive of the fact that the impact of geographic diversification on value is rather unconditional, whereas the value impact of industrial diversification on value is somewhat more conditional. Although difficult to interpret cleanly because of issues related to the measurement of the intensity variables, these findings further support the claim that impacts of corporate diversification should be studied simultaneously rather

than in isolation.

VII. Summary and Conclusions

In this paper we are interested in determining the valuation effects of both industrial and geographic diversification. We use three common measures of firm valuation: the excess market value of equity to sales ratio, the market-to-book ratio for total assets of the firms, and the price to earnings ratio and show that geographical diversification is value increasing and industrial diversification is value decreasing. Moreover, for each of these measures, the size of the value effect of the two forms of corporate diversification are of similar order of magnitude, though opposite in sign.

Using a value measure that controls for both industry effects and composition and multinationality, we find similar univariate results. The average value effect of geographic diversification is equal and opposite to the average value effect of industrial diversification, and on the order of 6% of firm capital. Multivariate tests on these industry-adjusted measures indicate that several other factors that relate to market value are positively correlated with geographic diversification, in particular firm size. Upon controlling for size and other measures that have been demonstrated to affect value, such as profitability, capital expenditures, R&D, advertising and leverage, we find that the magnitude of the industrial diversification effect is significantly larger than that of geographic diversification; although the impact of geographic diversification remains both statistically and economically significant.

Further tests, suggest that the failure to control for industrial diversification when determining the value impact of geographic diversification has no discernible impact on the estimate of the geographic diversification effect. However, failure to control for geographic diversification has an economically large effect on the estimated impact of industrial diversification on value. Not controlling for geographic diversification lead to a 40% over-estimate of the average effect of industrial diversification on value. Finally, tests on the value impact of each form of diversification conditional on the other, suggest that while the value implications of geographic diversification appear rather unconditional, the value impacts of industrial diversification are more conditional. The negative consequences of industrial diversification appear worse among domestic firms than among multinational firms.

We conclude that commonly discussed negative value impact of industrial diversification should be linked to the statistically and economically significant positive value effect to geographic diversification. Moreover, our results suggest that studies looking at the impact of diversification on firms need to consider both forms of diversification simultaneously in order to accurately assess the relative value impact of each form of diversification.

Appendix

The industry adjusted value measure we use is similar in nature to the one used in Berger and Ofek (1995). We compute the value measure in the following fashion:

$$\textit{Industry Adjusted Market Value Measure}_{i,t} = \ln\left(\frac{\text{Market Value of Assets}_{i,t}}{\text{Imputed Value of Assets}_{i,t}}\right) \quad \text{(A1)}$$

$$\textit{Imputed Value of Assets}_{i,t} = \sum_{k=1}^{n}\left(SS_{i,t,k}\cdot\gamma_k\right) \quad \text{(A2)}$$

where:

Market Value of Assets $_{i,t}$ = firm's total capital (market value of common equity plus book value of debt and preferred stocks) for firm i at year t,

Imputed Value of Assets $_{i,t}$ = sum of imputed value of assets of firm's segments as stand-alone activities,

$SS_{i,t,k}$ = sales revenue in industry segment k reported by firm i at year t,

γ_k = median total market capitalization -to-sales ratio for the domestic-single activity firms in industry k,

n = number of industrial segments reported by firm i at year t,

ln = the natural logarithm function.

Equation (A1) shows the industry-adjusted value measure is the natural logarithm of the ratio of the firm's actual value to its imputed value. The firm's imputed value is expressed in equation (A2) as the sum of the imputed asset value of each segment. To compute the segment imputed capital value, we multiply an industry median capital-to-sales multiplier for domestic-single-activity firms by the segment sales in the same industry reported by the firm. Thus the imputed value of each segment represents the imputed capital of firm's industry segment as if it is a stand-alone domestic-single-activity firm. We repeated this process for each of the firm's segments and then sum them to obtain the firm's imputed capital value.

We find the firm's industry-adjusted value measure by taking the natural logarithm of the ratio of actual to imputed value. The measure will have a value of less than zero if the actual value of firm is less than the imputed market capitalization of its segments based upon the median market capital-to-sales ratio of domestic-single-activity firms in each industry. This suggests that a firm is less valuable than the sum of its components on a standalone basis. Similarly, the measure will have a value of greater than zero if the actual value of the firm is more than the imputed market value. This suggests that a firm is more valuable than the sum of its components on a stand-alone basis.

Berger and Ofek (1995) obtain their median industry multipliers on a base sample of single-activity firms, which include both domestic and multinational firms. We, on the other hand, compute the industry median multipliers on a base sample of single-activity domestic firms, a subset of those used by Berger and Ofek. Single-activity multinational firms are excluded when we compute the industry median multipliers. This procedural difference is required because we examine the valuation effects of both industrial and geographic diversification. The single-activity domestic firm is not diversified along any direction. Excluding the single-activity multinational firms when computing the median multipliers helps avoiding a potential bias that would act toward increasing the significance of our test. The positive value effect of geographic diversification of the single-activity multinational firms has the potential of over-estimating the imputed value for multiple-activity domestic firms while under-estimating the imputed value for the single-activity multinational firms, if the single-activity multinationals are included to compute industry median multipliers.

References

Aggrawal, A., J. F. Jaffe, and G. N. Mandelker, 1992 The post merger performance of acquiring firms: A re-examination of the anomaly, Journal of Finance, 47, pp. 1605 - 22.

Allen, L., and C. Pantzalis, 1996, Valuation of the operating flexibility of multinational corporations, University of Manitoba working paper.

Berger, P. and E. Ofek, 1995, Diversification's effect on firm value, Journal of Financial Economics, 25, 39-65.

Bodnar, G. M., and J. Weintrop, 1997, The valuation of the foreign income of U.S. multinational firms: A growth opportunities perspective, Journal of Accounting and Economics, 24, forthcoming.

Boston Consulting Group, 1997, Premium Conglomerates, Working paper.

Brewer, H. 1981, Investor benefits from corporate international diversification, Journal of Quantitative Analysis 16, 113-126.

Buhner, R., 1987, Assessing international diversification of West German corporations, Strategic Management Journal, 8, pp. 25-37.

Business Week, 1995, The case against mergers, Special Report, October 30, p. 122 - 138.

Caves, R., 1971, International corporations: the industrial economics of foreign investment, Econometrica, 38, 1-27.

Comment, R., and G. Jarrell, 1995, Corporate focus and stock returns, Journal of Financial Economics, 25, 67-87.

Copeland , T., and F. Weston, 1979, Financial theory and corporate policy, (Addisson Wesley: Reading MA).

Desai, A. S., S. Dukas, and A. M. Fatemi, 1996, The valuations effects of trans-national acquisitions: Evidence from the Pacific basin, Kansas State University Working Paper.

Doukas, J., and N. Travlos, 1988, The effect of corporate multi-nationalism on shareholders' wealth: Evidence from international acquisitions, Journal of Finance, 43, 1161-1175.

Eckbo, B., 1985, Mergers and the market concentration doctrine: Evidence from the capital market, Journal of Business, 58, 325-49.

Errunza V., and L. Senbet, 1981, The effects of international operations on market value of the firm: theory and evidence, Journal of Finance, 36, 401-417.

Errunza, V., and L. Senbet, 1984, International corporate diversification, market valuation and size-adjusted evidence, Journal of Finance, 34, 727-745.

Fatemi, A., 1984, Shareholder benefits from corporate industrial diversification, Journal of Finance 39, 1325-1344.

Financial Accounting Standards Board, 1978, Statement of Financial Accounting Standards No. 14: Financial Reporting for Segments of a Business Enterprise. (FASB: Stamford, Conn).

Hines, J., and E. Rice, 1990, Fiscal paradise: Foreign tax havens and American business, NBER paper, no. 3477.

Hymer, S., 1976, The international operations of national firms: A study of direct foreign investment, Cambridge: MIT Press, Dissertation, Massachusetts Institute of Technology 1960.

Jensen, M., and W. Meckling, 1976, The theory of the firm: Managerial behavior, agency costs, and ownership structure, Journal of Financial Economics, 3, 305-60.

Jensen, M., and R. Ruback, 1983, The market for corporate control: The scientific evidence, Journal of Financial Economics, 11, 5-50.

Kaplan, S., and M. Weisbach, 1992, The success of acquisitions: Evidence from divestitures, Journal of Finance, 47, 107-38.

Kim, W., and E. Lyn, 1986, Excess market value, the multinational corporation, and Tobin's *q* ratio, Journal of International Business Studies, 17, 117-126.

Kim, W. C., P. Huang, and W. P. Burgers, 1989, Global diversification strategy and corporate profit performance Strategic Management Journal, 10, 45-57.

Kogut, B., 1983, Foreign direct investment as a sequential process, Charles P. Kindelberger and David (Eds.), The Multinational Corporations in the 1980's, MIT Press, Cambridge, MA.

Kogut, B., and N. Kulatilaka, 1994, Operating flexibility, global manufacturing, and the option value of a multinational network, Management Science, 40, 123-39.

Lang, L., and R. Stulz, 1994, Tobin's q, Corporate Diversification, and Firm Performance, Journal of Political Economy, 102:6, 1248-80.

Markides C., and C. Ittner, 1994, Shareholder benefit from corporate international diversification: Evidence from U.S international acquisitions," Journal of International Business Studies, 25:2, 343-366.

Michel A., and I., Shaked, 1986, Multinational corporations vs. domestic corporations: financial performance and characteristics, Journal of International Business Studies, 18, 89-100.

Mikhail, A., and H. Shawky, 1979, Investment performance of U.S.-based multinational corporations, Journal of International Business Studies, 10, 53-66.

Miller, J., and B. Pras, 1980, The effects of multinational and export diversification on the profit and stability of U.S. corporations, Southern Economic Journal, 46, 792-805.

Morck, R., A. Shliefer, and R. Vishny, 1990, Do managerial objectives drive bad acquisitions?, Journal of Finance, 45, 31-48.

Morck, R., and B. Yeung, 1991, Why investors value multinationality, Journal of Business, 64, 165-187.

Morck, R., and B. Yeung, 1992, Internalization: An event study, Journal of International Economics, 33, 41-56.

Myers, S. C., 1977, The determinants of corporate borrowing, Journal of Financial Economics, 5, 147-75.

Rugman, A., 1979, International Diversification and the Multinational Enterprise, (Heath: Lexington, MA).

Sambharya, R., 1995, The combined effect of international diversification and product diversification strategies on the performance of U.S. based multinational corporations, Management International Review, 35, 197-218.

Senchek A., and W. L. Beedles, 1980, Is indirect international diversification desirable?, Journal of Portfolio Management, Winter, 49-57.

Stulz, R., 1990, Managerial discretion and optimal financing policies, Journal of Financial Economics, 26, 3-27.

Wernerfelt, B., and C. Montgomery, 1988, Diversification, Ricardian rents and Tobin's q, Rand Journal of Economics, 623-32.

Weston, J., 1970, The nature and significance of conglomerate firms, St. John's Law Review, 44, 66-80.

White, H., 1980, A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica 48, 817-838.

Wolf, B., 1975, Size and profitability among U.S. manufacturing firms: multinational versus primarily domestic firms, The Journal of Economics and Business, 28, 15-22.

Wolf, B., 1977, Industrial diversification and internationalization: some empirical evidence, Journal of Industrial Economics, 26, 177-191.

Table 1: Descriptive Statistics

Descriptive statistics are for a sample of 24,522 observations of single and multiple industrial and geographic segment firms with sales of more than $20 million and information available from COMPUSTAT Business Segment database. Segments are lines of business for which separate accounting disclosures are made in accordance with FASB No. 14 and SEC Regulation S-K. Single Industrial Segment Firms are those reporting only one segment on the COMPUSTAT Industrial Segment database, whereas multi-segment firms are those reporting two or more segments on the same database. Domestic firms are those reporting only a domestic (U.S.) geographic segment on the COMPUSTAT Geographic Segment database, whereas MNC (multinational companies) are those reporting two or more segments, including a U.S. segment, on the same database. Thus, a domestic firm reporting one industry segment is grouped in group 1, whereas a multinational firm reporting the same is grouped in group 2, and etc. Numbers on the first (second) line of each variable indicate the mean (median) statistics of the variable. Between group significance of medians is assessed using the nonparametric median test, and for means, a t-test. The statistics are reported as mean on top and median below, with the exception of the first 2 rows which are total values. All data are from COMPUSTAT.

	Single-industry Firms		Multi-industry Firms		Test of Differences					
	Domestic	MNC	Domestic	MNC						
	(1)	(2)	(3)	(4)	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Number of Firms	2,712	1,197	996	784						
Total Observation	11,058	5,173	4,322	3,969						
Number of Industrial Segments	1	1	2.91	3.18						
	1	1	3	3						
Number of Geographic Segments	1	3.86	1	4.66						
	1	3	1	4						
Total Sales ($mil.)	502	796	1,044	3,601	6.334[a]	10.489[a]	20.075[a]	3.856[a]	17.634[a]	15.913[a]
	101	185	215	907	22.445[a]	22.777[a]	55.484[a]	3.426[a]	37.075[a]	30.909[a]
Total Assets ($mil.)	736	941	1,815	5,009	2.380[a]	8.539[a]	16.770[a]	6.273[a]	15.557[a]	11.511[a]
	101	160	240	787	16.773[a]	24.086[a]	52.530[a]	9.742[a]	37.836[a]	24.595[a]
Total Capital ($mil.)	1,036	1,394	2,253	6,629	3.313[a]	7.367[a]	18.727[a]	4.801[a]	17.082[a]	13.221[a]
	151	254	303	1,158	16.469[a]	18.472[a]	46.945[a]	4.632[a]	31.895[a]	24.317[a]
Debt to Asset Ratio	0.317	0.252	0.327	0.297	14.710[a]	1.798[a]	4.596[a]	13.071[a]	9.320[a]	5.240[a]
	0.285	0.202	0.314	0.269	-14.130[a]	4.878[a]	-0.162	17.970[a]	14.436[a]	-5.625[a]
EBIT on Sales	0.106	0.079	0.086	0.079	10.381[a]	7.571[a]	11.591[a]	2.896[a]	0.036	3.256[a]
	0.073	0.079	0.072	0.074	-1.396	-1.978[b]	-1.621[c]	-0.197	-1.411	-0.186
Capital Expenditure on Sales	0.096	0.079	0.108	0.076	5.807[a]	2.857[a]	6.952[a]	6.644[a]	0.954	7.344[a]
	0.038	0.043	0.049	0.049	5.707[a]	11.501[a]	11.482[a]	6.768[a]	6.690[a]	-1.122
R&D Expenditure on Sales	0.033	0.062	0.016	0.026	14.656[a]	10.629[a]	4.210[a]	28.425[a]	22.750[a]	10.361[a]
	0.000	0.037	0.004	0.016	38.783[a]	4.228[a]	25.986[a]	-30.153[a]	-20.435[a]	-20.106[a]
Advertising Expense on Sales	0.019	0.023	0.015	0.017	5.558[a]	4.757[a]	1.455	8.390[a]	5.690[a]	2.717[a]
	0.009	0.011	0.000	0.000	4.303[a]	5.905[a]	6.494[a]	9.224[a]	9.516[a]	0.219

Tables Notes: [a] Significant at the 0.001 level; [b] Significant at the 0.05 level; [c] Significant at the 0.1 level.

Table 2
Excess Values Measures by Both Forms of Diversification

PANEL A: (Market Value of Equity - Book Value of Equity)/ Total Sales

		Geographic Diversification		
		Domestic	**Multinational**	
Industrial Diversification	**Single Activity**	Q1 0.015 Median 0.232 Q3 0.754 N = 9486 iseg = 1 gseg = 1	Q1 0.055 Median 0.310 Q3 0.892 N = 4693 iseg = 1 gseg = 3.86	%Δ in Median 33.6% Test Stats Median Z = 7.091 Wilcoxon Z = 7.296
	Multi Activity	Q1 -0.001 Median 0.162 Q3 0.474 N = 3982 iseg = 2.91 gseg = 1	Q1 0.028 Median 0.198 Q3 0.551 N = 3765 iseg=3.18 gseg=4.66	%Δ in Median 22.2% Test Stats Median Z = 3.897 Wilcoxon Z = 5.051
		%Δ in Median -30.1% Test Stats Median Z = -7.666 Wilcoxon Z = -9.587	%Δ in Median -36.1% Test Stats Median Z = -9.954 Wilcoxon Z = -10.724	%Δ in Median -14.6% Test Stats Median Z = -3.666 Wilcoxon Z = -4.337

PANEL B: Market Value of Assets/ Book Value of Assets

		Geographic Diversification		
		Domestic	**Multinational**	
Industrial Diversification	**Single Activity**	Q1 1.105 Median 1.246 Q3 1.814 N = 9467 iseg = 1 gseg = 1	Q1 1.068 Median 1.383 Q3 2.004 N = 4684 iseg = 1 gseg = 3.86	%Δ in Median 11.0% Test Stats Median Z = 10.081 Wilcoxon Z = 10.295
	Multi Activity	Q1 0.995 Median 1.130 Q3 1.423 N = 3982 iseg = 2.91 gseg = 1	Q1 1.033 Median 1.215 Q3 2.398 N = 3765 iseg=3.18 gseg=4.66	%Δ in Median 7.6% Test Stats Median Z = 9.321 Wilcoxon Z = 8.701
		%Δ in Median -9.3% Test Stats Median Z= -13.253 Wilcoxon Z = -14.163	%Δ in Median -12.1% Test Stats Median Z = -12.259 Wilcoxon Z = -13.961	%Δ in Median -2.5% Test Stats Median Z = -3.039 Wilcoxon Z = -5.087

PANEL C: Price / Earnings per Share

		Geographic Diversification		
		Domestic	**Multinational**	
Industrial Diversification	**Single Activity**	Q1 5.709 Median 12.376 Q3 20.227 N = 9457 iseg = 1 gseg = 1	Q1 6.818 Median 14.326 Q3 21.914 N = 4659 iseg = 1 gseg = 3.88	%Δ in Median 15.8% Test Stats Median Z = 9.038 Wilcoxon Z = 6.659
	Multi Activity	Q1 5.468 Median 11.561 Q3 18.062 N = 3956 iseg = 2.91 gseg = 1	Q1 7.634 Median 13.025 Q3 19.419 N = 3743 iseg=3.19 gseg=4.69	%Δ in Median 12.7% Test Stats Median Z = 7.011 Wilcoxon Z = 5.954
		%Δ in Median -6.6% Test Stats Median Z = -4.425 Wilcoxon Z = -4.339	%Δ in Median -9.1% Test Stats Median Z = -5.289 Wilcoxon Z = -4.315	%Δ in Median 5.2% Test Stats Median Z = 3.186 Wilcoxon Z = 2.248

Table Notes: Panel A reports conditional distribution of an excess value measure (the difference between the market value and book value of the firm's common equity scaled by total sales) by industrial and geographic diversification. Q1, Median and Q3 are the first, second, and third quartiles, respectively, of the distributions; N refers to the number of observations in each group. Iseg is the mean number of industrial segments that the firm reports on its financial statement, as reported on the COMPUSTAT Industrial Segment tape. Gseg is mean number of foreign (non-domestic) geographic locations that the firm reports on its financial statement, as reported on the COMPUSTAT Geographic Segment tape. The %Δ in median refers to differences in medians between the two firms in the corresponding row column or diagonal. The test statistics refer to tests on the differences between the same two boxes. The test statistics are Z-scores that are distributed N(0,1). The Wilcoxon test statistics is for a Wilcoxon rank sum test that the two distributions are similar. The median test statistic is for the test that the medians of the two distributions are similar.

Panel B report the same information as Panel A except that excess value is defined as the market value of common equity scaled by the book value of common equity.

Panel C report the same information as Panel A except that excess value is defined as the P/E ratio (share price divided by primary earnings per share).

Table 3: Excess Value Using Adjusted Value Measure

Conditional distributions of industry adjusted value measures by form of diversification. Value measure is the natural log ratio of the market value of total assets to the sum of the estimated market value of each of the firm's industrial segments using the sales to market value multiplier from the median domestic single activity firm in that particular industry with more than $20 million in sales. By definition the median measure for the single activity domestic firms will be zero. The null hypothesis of diversification having no value impact implies that all boxes should have identical distributions. The test statistics refer to tests on the differences between the two boxes.

ln(MVA/ Imputed MVA)		**Geographic Diversification: Domestic**	**Geographic Diversification: Multinational**	
Industrial Diversification	**Single Activity**	Q1 -0.2923 / Median 0.0000 [1.000] / Q3 0.2973 Mean 0.0204 (t = 3.375) N = 9266 iseg = 1 gseg = 1	Q1 -0.3673 / Median 0.0494 [0.000] / Q3 0.4724 Mean 0.0614 (t = 6.201) N = 4589 iseg = 1 gseg = 3.88	Row Test Stats Median Z = 5.331 Wilcoxon Z = 4.439 2-sample t-test t = 3.734
	Multi Activity	Q1 -0.3943 / Median -0.0645 [0.000] / Q3 0.2466 Mean -0.0677 (t = -6.479) N = 3092 iseg = 2.76 gseg = 1	Q1 -0.3050 / Median 0.0010 [0.985] / Q3 0.3050 Mean 0.0047 (t = 0.479) N = 2862 iseg = 3.00 gseg = 4.65	Row Test Stats Median Z = 4.461 Wilcoxon Z = 5.549 2-sample t-test t = 5.042
Diagonal Test Stats* Median Z = -0.791 Wilcoxon Z = -0.903 2-sample t-test t = -0.396		Column Test Stats Median Z = -6.106 Wilcoxon Z = -7.183 2-sample t-test t = -7.289	Column Test Stats Median Z = -3.706 Wilcoxon Z = -3.820 2-sample t-test t = - 4.059	Diagonal Test Stats Median Z = 0.309 Wilcoxon Z = 0.086 2-sample t-test t = -1.358

Table Notes: The test statistics are Z-scores that are distributed N(0,1). The Wilcoxon test statistics is for a Wilcoxon rank sum test that the two distributions are similar. The median test statistic is for the test that the medians of the two distributions are similar. The bottom corner boxes report tests for the corresponding diagonals. The bottom left box tests that the distributions in the corresponding diagonal are mirror images on one another.

Table 4: Multivariate Tests for Diversification Value Impacts

OLS estimates of the regression of excess value on geographic and industrial diversification indicators, year dummies (for Panel A, not reported) and relative control variables. The dependent variable is the excess value adjusted for industry and multinationality measured as the natural logarithm of the ratio of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed market values of its segments, with each segment's imputed value equal to the segment's sales multiplied by the median ratio of capital to sales among the domestic single-activity firms in that industry. The extreme values of the natural logarithm of actual to imputed value above 1.386 or below -1.386 (i.e., actual values either more than four times imputed, or less than one-fourth imputed value) are deleted. Indicator variables for geographic diversification and industrial diversification take a value of 1 is the firms reports any segment information in that dimension and zero otherwise. The other control variables are all measured as the difference from the industry (or sales weighted industries) median measures. Observations with an R&D to sales or advertising to sales ratio greater than 50% are deleted from the sample. The other control variables are calculated in a straightforward fashion given their definition using standard COMPUSTAT data. Panel A reports the results for the pooled regression from 1987 - 1993, and Panel B reports the means of the estimates and the associated standard error of the seven year-by-year regressions.

OBS R^2	Intercept	Geographic Diversification Indicator	Industrial Diversification Indicator	Relative Firm Size Ln(Sales)	Relative Leverage (D/A)	Relative EBIT/ Sales	Relative Capital Expenditures/ Sales	Relative R&D/ Sales	Relative Advertising/ Sales
Panel A: Pooled Sample									
dependent variable: industry and multinationality adjusted value measure									
17951	-0.0640	0.0220	-0.0537	0.0142	0.0171	1.6910	0.6063	2.3622	0.2201
0.1852	(0.0105)[a]	(0.0079)[a]	(0.0078)[a]	(0.0027)[a]	(0.0220)	(0.0808)[a]	(0.0636)[a]	(0.1324)[a]	(0.1337)[c]
Panel B: Means of Year-by-Year Estimates									
dependent variable: industry and multinationality adjusted value measure									
7	-0.0231	0.0260	-0.0527	0.0120	0.0116	2.0251	0.8761	2.4657	0.1957
0.2108	(0.0342)	(0.0130)[b]	(0.0047)[a]	(0.0026)[a]	(0.0255)	(0.0597)[a]	(0.0732)[a]	(0.1000)[a]	(0.1871)

Table Notes: Panel A: the top number is the OLS estimate of the parameter and the numbers below in parentheses is the White (1980) heteroskedasticity corrected standard error. Superscript a, b, and c indicate statistical significant at the 1, 5 and 10 percent levels for two tailed tests. Panel B: the tope number is the mean of the parameter estimate across the seven single year regressions. The number in parentheses is the standard error of the mean. Superscript a, b, and c indicate statistical significant at the 1, 5 and 10 percent levels for two tailed tests for a t-test with 6 degrees of freedom.

Table 5: Multivariate Tests for Diversification Value Impacts and Effect of Omitted Variable Problem

OLS estimates of the regression of two different measures of excess value on either an industrial or geographic diversification indicator, year dummies (not reported) and relative control variables. The dependent variable in Panel A is the excess value measured as the natural logarithm of the ratio of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed market values of its segments, with each segment's imputed value equal to the segment's sales multiplied by the median ratio of capital to sales among all single-activity firms in that industry (without regard to multinationality). The dependent variable in Panel B is the excess value measured as the natural logarithm of the ratio of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed value of its sales—total sales multiplied by the median ratio of capital to sales among all domestic firms whose primary activity is reported in that industry (without regard to multiactivity). The extreme values of the natural logarithm of actual to imputed value above 1.386 or below -1.386 (i.e., actual values either more than four times imputed, or less than one-fourth imputed value) are deleted. Indicator variables for geographic diversification and industrial diversification take a value of 1 is the firms reports any segment information in that dimension and zero otherwise. The other control variables are all measured as the difference from the industry (or sales weighted industries) median measures. Observations with an R&D to sales or advertising to sales ratio greater than 50% are deleted from the sample. The other control variables are calculated in a straightforward fashion given their definition using standard COMPUSTAT data.

OBS R^2	Intercept	Geographic Diversification Indicator	Industrial Diversification Indicator	Relative Firm Size Ln(Sales)	Relative Leverage (D/A)	Relative EBIT/ Sales	Relative Capital Expenditures/ Sales	Relative R&D/ Sales	Relative Advertising/ Sales
PANEL A: Effect of not Controlling for Geographic Diversification									
Dependent Variable: Industry adjusted value measure created ignoring geographic diversification									
17951	-0.0673	-	-0.0760	0.0214	0.0667	1.6014	0.5773	2.4304	0.2321
0.1847	(0.0098)[a]	(-)	(0.0075)[a]	(0.0026)[a]	(0.0207)[a]	(0.0818)[a]	(0.0616)[a]	(0.1550)[a]	(0.1387)[c]
PANEL B: Effect of not Controlling for Industrial Diversification									
Dependent Variable: Industry adjusted value measure created ignoring industrial diversification									
17951	-0.0762	0.0229	-	0.0190	0.0287	1.5681	0.6139	2.2141	0.4095
0.1685	(0.0106)[a]	(0.0083)[a]	(-)	(0.0028)[a]	(0.0211)	(0.0799)[a]	(0.0643)[a]	(0.1282)[a]	(0.1548)[a]

Table Notes: The top number is the OLS estimate of the parameter and the numbers below in parentheses is the White (1980) heteroskedasticity corrected standard error. Superscript a, b, and c indicate statistical significant at the 1, 5 and 10 percent levels for two tailed tests.

Table 6: Conditional Value Impacts of Diversification

OLS estimates of the regression of two different measures of excess value on either an industrial or geographic diversification indicator, year dummies (not reported) and relative control variables. The dependent variable is the excess value, adjusted for both industry and multinationality, measured as the natural logarithm of the ratio of a firm's actual value to its imputed value. A firm's imputed value is the sum of the imputed market values of its segments, with each segment's imputed value equal to the segment's sales multiplied by the median ratio of capital to sales among all single-activity domestic firms in that industry. The extreme values of the natural logarithm of actual to imputed value above 1.386 or below -1.386 (i.e., actual values either more than four times imputed, or less than one-fourth imputed value) are deleted. Intensity measures for geographic diversification and industrial diversification are one plus the natural log of the total number of geographic or industrial segments for which data is reported in the Compustat Segment databases. The other control variables are all measured as the difference from the industry (or sales weighted industries) median measures. Observations with an R&D to sales or advertising to sales ratio greater than 50% are deleted from the sample. The other control variables are calculated in a straightforward fashion given their definition using standard COMPUSTAT data. Panel A runs regressions on the full sample conditional on industrial diversification or not. Panel B runs regressions on the full sample conditional upon geographic diversification or not.

OBS R^2	Intercept	Geographic Diversification Intensity	Industrial Diversification Intensity	Relative Firm Size Log(Sales)	Relative Leverage (D/A)	Relative EBIT/ Sales	Relative Capital Expenditures/ Sales	Relative R&D/ Sales	Relative Advertising/ Sales
PANEL A: Conditional tests of the Value Impact of Geographic Diversification									
Single-Activity Firms Only									
12572	-0.0784	0.0180	-	0.0135	-0.0750	1.7228	0.5716	2.2877	0.4479
0.1966	(0.0157)[a]	(0.0075)[a]	(-)	(0.0037)[a]	(0.0257)[a]	(0.0880)[a]	(0.0735)[a]	(0.1513)[a]	(0.1726)[a]
Multiactivity Firms Only									
5379	-0.2251	0.0215	0.0318	0.0112	0.1911	1.4955	0.6828	3.5282	-0.3352
0.1626	(0.0623)[a]	(0.0096)[a]	(0.0258)	(0.0046)[a]	(0.0285)[a]	(0.1921)[a]	(0.1241)[a]	(0.3416)[a]	(0.2143)
PANEL B: Conditional Tests of the Value Impact of Industrial Diversification									
Domestic Firms Only									
10998	0.0428	-	-0.0741	0.0201	0.0297	1.4544	0.5270	2.7965	0.2583
0.1626	(0.0324)	(-)	(0.0161)[a]	(0.0040)[a]	(0.0277)	(0.0979)[a]	(0.0656)[a]	(0.2054)[a]	(0.2080)
Multinational Firms Only									
6953	0.0121	0.0334	-0.0558	0.0002	0.0122	2.1403	0.8995	2.1836	0.1497
0.2271	(0.0428)[b]	(0.0122)[a]	(0.0160)[a]	(0.0040)	(0.0354)	(0.1367)[a]	(0.0823)[a]	(0.1723)[a]	(0.1836)

Table Notes: The top number is the OLS estimate of the parameter and the numbers below in parentheses is the White (1980) heteroskedasticity corrected standard error. Superscript a, b, and c indicate statistical significant at the 1, 5 and 10 percent levels for two tailed tests.