Geographic Diversification and Firm Value in the Financial Services Industry*

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Abstract

This paper investigates whether geographic diversification is value-enhancing or value-destroying in the financial services sector, broadly defined. Our dataset comprises approximately 3,579 observations over the period from 1985 to 2004 and covers the entire range of U.S. financial intermediaries – commercial banks, investment banks, insurance companies, asset managers, and financial infrastructure services firms. We use three alternative measures of geographic diversification: (1) a dummy variable whether the firm reports more than one geographic segment, (2) the percentage of sales from non-domestic operations, and (3) a sales-based Herfindahl-Hirschman index (HHI). Our results indicate that on a stand-alone basis geographic diversification, as measured by the dummy variable or the percentage of sales from non-domestic operations, is not associated with a significant valuation discount in financial intermediaries. However, geographic diversity is value-destroying when measured by the HHI. We conclude that geographic diversification is value-destroying when there are more geographic segments and the activities are distributed relatively evenly over these segments. We observe an exception in the investment banking sector. The results are robust after taking into account functional diversification of the firms as well as a potential endogeneity of both functional and geographic diversification.

Keywords: Geographic diversification; Functional diversification; Organizational structure; Financial intermediaries; Firm valuation

JEL Classification: G20, G32, G34

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1. Introduction

This paper investigates whether or not geographic diversification is value-enhancing or value-destroying in the financial services industry. Recent research on non-financial firms shows that both functional diversification as well as geographic diversification are associated with a lower market value (e.g., see Denis, Denis, and Yost; 2002, Fauver, Houston, and Naranjo, 2004). However, the empirical evidence is not conclusive. Bodnar, Tang, and Weintrop (1999), for example, find a slight premium associated with geographical diversification in a sample of U.S. non-financial firms covering the period 1984 to 1997. To our knowledge, there is no evidence so far on the relation between geographic diversification and firm value for financial intermediaries. Lack of evidence notwithstanding, DeLong (2001b) argues that an analysis of the geographic dimension of diversification is potentially more interesting for financial than for non-financial firms since financial services firms are likely to require proximity to the client to be competitive.

There is however some event-study evidence on the announcement-effect associated with focusing and diversifying bank mergers. DeLong (2001a), for example, shows for a sample of domestic U.S. mergers (where at least one firm is a bank) that bank mergers that focus both functional and geographic activities enhance firm value by roughly 3% while non-focusing mergers do not create value. Houston and Ryngaert (1994) find that the market rewards financial services mergers where geographic overlap exists between acquirer and target, whereas DeLong (2001b) finds no significant relation between long-term performance of bank mergers and geographic overlap between the two merged entities. Brewer, Jackson, Jagtiani, and Nguyen (2001) find that merger premiums increased by about 35 percent as a result of geographic deregulation, in this case the passage of the 1997 Riegle-Neal act, which eliminated geographic restrictions for U.S. banking operations.

The rationales put forward for geographic diversification include: (1) Domestic or regional market saturation or competition-policy limits on further consolidation; (2) Better macro or financial restructuring prospects in other geographic regions, helping to justify growth-stock valuations in equity markets; (3) The need for viable physical presence in major markets for wholesale financial services (e.g., fixed-income, primary and secondary equities, merger and acquisitions services) that have themselves become global and require continuous client coverage and execution; (4) The search for first-mover advantages as financial deregulation opens local markets to outside competitors; and (5) Reduction in firm-specific risk associated with operations across currencies as well as macro and financial environments that are not perfectly correlated. Possible value-destroying factors associated with geographic diversity include the cost of increased managerial and operational complexity, increased internal information and contracting costs, heightened regulatory and compliance costs, as well as greater exposure to sovereign risk.[1]

Recent years have seen a burgeoning of mergers and acquisitions in the financial services sector. Of approximately 372,000 M&A transactions in all industries valued at $31.3 trillion during 1985-2007 worldwide, approximately 126,500 transactions valued at $12.2 trillion (39 percent by value) involved the financial services industry.[2] These transactions presumably had as their principal objective increasing the value of the firms involved through some combination of revenue enhancement, improved operating efficiency, or risk reduction. All of the transactions either increased the respective firm's market share, defined functionally or geographically, or diversified its operations across financial functions or geographies (or both). Of the aforementioned financial-sector transactions, 24.6% by value were "cross-market," involving at least two areas of financial services activity, and about 9.2% were "cross-border" involving more than one country.

[1] For a discussion, see Walter (2004), Chapter 2.
[2] The data cover only transactions valued at $100 million or more. Source: Thomson Financial Securities Data Corporation.

This paper investigates the valuation effect of geographic diversification, using a large sample of U.S. financial intermediaries over the 20-year period from 1985 to 2004. Our sample covers the entire range of financial intermediaries – commercial banks, investment banks, insurance companies, asset managers, and financial infrastructure services firms (clearance, settlement, payments, custody, etc.). Since a failure to account for functional diversification may lead to an omitted variables problem and limit the inferences about the value impact of geographic diversification, we account for functional diversification as well.

In contrast to non-financial firms, there is little literature on the valuation effects of functional diversification in financial services firms. Two exceptions are the recent papers by Laeven and Levine (2007) and Schmid and Walter (2008), both of which investigate the valuation effect of functional diversification in the financial sector. Both papers report statistically significant discounts associated with functional diversification in the magnitude of 9% to 41% and 8% and 72%, respectively, depending on the data sample, variable definitions, and estimation methodology.

Our results in this paper indicate that geographic diversification in general (as measured by a dummy variable or the percentage of sales associated with non-domestic operations) is not associated with a discount. However, the results based on a Herfindahl-Hirschman index (HHI) suggest that geographic diversity is value-destroying when there are more geographic segments and when the activities are distributed relatively evenly over these segments. We also investigate whether the valuation effect of geographic diversification depends on the firms' main activity-area within the financial services industry. In this analysis, we differentiate between the three principal activity-areas based on the company SIC/NAICS classification, accounting for approximately 98.4% of all observations in our sample: (1) credit intermediation, (2) insurance carriers, and (3) securities broker-dealers. The results indicate a valuation premium associated with geographic diversification when measured by the dummy variable

(or the percentage of sales stemming from non-domestic operations) for credit intermediaries and insurance companies. In contrast, there is a significant valuation discount for securities firms. The intuition is that markets for credit intermediation and insurance are largely multi-local, whereas the securities sector is heavily globalized and requires successful competitors to link issuers and investors as well as arbitrage markets worldwide. Nevertheless, the coefficient on the HHI is estimated negative and significant in all financial services activity-areas. These results are robust to taking into account a potential endogeneity of both functional and geographic diversification by estimating instrumental variables regressions.

The remainder of the paper is organized as follows. Section 2 outlines the sources of data, the sample selection procedure, and describes the variables. Section 3 presents the descriptive statistics and univariate analysis and Section 4 the results from the multivariate regression analysis. Finally, Section 5 concludes.

2. Sample Selection and Variables

2.1 Sample Selection

The sample consists of all financial firms (SIC 6000-6999 and NAICS 520000-529999) over the period from 1985 to 2004, with data reported on both the Compustat Segment and Industrial Annual data files and total assets of at least $100 million. We exclude years where more than 50% of a firm's sales or assets stem from segments outside the financial sector or are classified as investment trusts (SIC 6730-6733 and 6798 and NAICS 525900-525990).[3] We also exclude firms that are listed as American Depository Receipts (ADRs).[4] For a firm to be included in our sample, all data necessary to calculate the geographic and functional diversification variables as well as the excess value measure (see the

[3] Compustat defines sales for financial companies as follows: total current operating revenue plus net pretax profit or loss on securities sold or redeemed minus non-recurring income.

[4] This restriction leads to a decrease in sample size of 131 firm-year observations (3.1%) for the excess value measure based on sales and 100 firm-year observations (2.6%) for the excess value measure based on assets. The inclusion of these observations does not materially change any of our results.

next two sections below) are required, leading to a final sample of 620 firms with a total of 3,579 firm-year observations

2.2 Excess Value Measure

To examine whether diversification increases or decreases corporate value, we use the modification to the excess value measure developed by Berger and Ofek (1995) as proposed by Bodnar, Tang, and Weintrop (1999) that compares a firm's value to its imputed value if its segments were operated as stand-alone entities.[5] Each segment of a diversified firm is valued based on the median sales multipliers for single-segment domestic firms in that industry. To calculate the excess value measure, we proceed as follows: First, we determine the imputed value for each segment by multiplying the segment's sales by the median ratio of the market value to sales for single-segment domestic firms in the same financial industry. The industry median ratios are based on the narrowest NAICS/SIC grouping that includes at least five single-segment firms with complete data and total assets of at least $100 million.[6] Next, the imputed value of the firm is calculated as the sum of the imputed segment values. This number estimates the value of the firm if all of its segments were operated as stand-alone entities. Finally, excess value is calculated as the log of the ratio of a firm's market value to its imputed value. A negative excess value indicates that a firm trades at a discount and a positive excess value implies that the firm trades at a premium.

Some of the segments of diversified firms in our sample have no NAICS or SIC codes assigned by Compustat. In contrast, most have a segment name, usually stated as "corporate and other", "eliminations", "corporate and unallocated", or a similar designation. We do not

[5] In unreported regression specifications, we alternatively use the standard excess value measure as proposed by Berger and Ofek (1995) that uses all single-segment firms in the segment's industry as a benchmark as compared to only domestic single-segment firms. All results remain qualitatively unchanged and are available from the authors upon request.

[6] The imputed value for 40.4% of all segments are based on five-digit NAICS (four-digit SIC) codes, 28.4% on four-digit NAICS (three-digit SIC) codes, 26.8% on three-digit NAICS (two-digit SIC) codes, and 4.5% on two-digit NAICS (one-digit SIC) codes.

treat these segments separately, but rather attribute their sales proportionally to the remaining segments in order to sum to the correct figure for the firm's total sales. Nevertheless, for some of the diversified firms in our sample the sum of all segment sales as provided by the Compustat Segment file disagrees with the respective firm total values from the Compustat Industrial Annual file. This problem is also noted by Berger and Ofek (1995), and we follow their approach by excluding observations for which the sum of the segment values deviates from the firm's total value by more than 25%. If the deviation is within 25%, we gross the firm's imputed value up or down by the percentage deviation between the sum of its segments' sales and total firm sales. Finally, again following Berger and Ofek (1995), we exclude extreme excess values from the analysis – i.e., the actual value is either larger than four times the imputed or less than one fourth of the imputed value.[7]

2.3 Measures of Diversification

One problem with geographic segment data compiled by Compustat is that there has been no requirement by either the Financial Accounting Standards Board or the Securities and Exchange Commission regarding the grouping for geographic areas (e.g., see Denis, Denis, and Yost, 2002). Some firms report segment data for different countries, others for different continents or geographic areas (e.g., Southeast Asia), while some firms report segment data for countries *and* continents. As a result, two firms with identical operations in the same countries might report them very differently, so that the number of geographic segments reported becomes a problematic measure of the degree of geographic diversification. As a proxy, Denis, Denis, and Yost (2002) use the percentage of sales (assets) from non-domestic operations. We use three alternative measures of geographic diversification: (1) a dummy

[7] We alternatively apply a stricter exclusion criterion and discard all observations for which the sum of the segment values deviates from the firm's total value by more than 5% and calculate an excess value measure which is based on a firm's total assets instead of sales in the calculation of the imputed firm value. In both cases, we find the results to be virtually unchanged and therefore do not report them in a table.

variable whether a firm reports more than one geographic segment, (2) the percentage of sales from non-domestic operations, and (3) a sales-based Herfindahl-Hirschman index.[8]

As noted previously, we additionally account for functional diversification to mitigate a potential omitted variables problem. We measure functional diversification based on a dummy variable which is equal to one if a firm reports more than one segment in Compustat's Segments data file. In unreported robustness checks, we use a number of alternative measures of diversification including the number of segments reported by Compustat, and a sales- and asset-based Herfindahl-Hirschman index (HHI), and find the results with respect to geographic and functional diversification to be unaffected by the choice of the measure of functional diversification.

3. Univariate Analysis and Reporting Change

We begin the univariate analysis by providing an overview of the number of sample firms for each calendar year, along with the number (and percentage) of geographically focused and diversified financial firms. The data in Table 1 show that the percentage of geographically diversified firms in our sample remained relatively constant at approximately 80% between 1986 and 1997 and then substantially dropped from 81.6% in 1997 to 56.6% in 1998 and then again to 23.6% in 1999. Between 1999 and 2004, the percentage of geographically diversified firms remained relatively constant and only slightly increased to 27.4% in 2004.

In 1998, SFAS 131 superseded SFAS 14 in the regulation of segment reporting. While one of the major concerns that triggered these changes was the under-reporting of functional segments, SFAS 131 also regulates the reporting of geographic segments. SFAS 131 requires companies to report disaggregated information about reportable segments based on the way

[8] Asset figures are available only for approximately one fourth of firm-years leading us to concentrate on sales figures. Another particularity in the data on geographic segments is that numerous firms report sales (and/or assets) figures of -0.01 for one segment. If the segment name applies to countries rather than continents or geographic areas, these segments often refer to Bermuda or a similar location – suggesting a letterbox company operated for tax reasons. Consequently, we do not treat these segments separately.

management organizes the firm for the purpose of making operating decisions and assessing performance. By requiring disclosure only of geographic areas in which a firm has material operations, SFAS 131 may well have resulted in a decrease of reported geographic segments, which seems to be the case in our sample.[9] As diversification before and after the introduction of SFAS 131 might not be directly comparable, we check the robustness of our results by repeating all analyses for the pre-1998 and post-1998 sub-samples. All of our main results are robust with respect to this sample segmentation and prevail in both sub-periods. Therefore, we do not report them in the paper for reasons of brevity.

In 1998, the (functional) segment reporting also changed from SIC to NAICS. On Compustat's Segments file, SIC codes are available for the years 1985 to 2000 and NAICS codes are available from 1990 to 2004. In general, we use NAICS codes where available (i.e., from 1990 to 2004) and SIC otherwise. To account for possible changes in segment reporting as a result of the change from SIC to NAICS (and the replacement of SFAS 14 by SFAS 131), we perform two robustness checks: First, we construct sub-samples, which are exclusively based on SIC codes (from 1985 to 2000) and NAICS codes (from 1990 to 2004). Second, as the introduction of NAICS coincides with the introduction of SFAS 131, the analyses explained above based on the pre-1998 and post-1998 sub-samples can be regarded as an additional robustness check.[10]

In Table 2, we provide a cross-tabulation of the sales-based excess value measure for functionally and/or geographically diversified firms. The results indicate that functionally diversified firm-years exhibit a significant discount irrespective of whether they are also geographically diversified. However, the discount is substantially and significantly smaller for firm-years in which they are also geographically diversified. Hence, our univariate results in-

[9] In contrast, for a small sample of 158 non-financial U.S. firms, Nichols, Street, and Gray (2000) report a slight increase in the percentage of geographically diversified firms upon introduction of SFAS 131.

[10] For all sub-samples and also when we use SIC codes where available and NAICS otherwise over the full sample, the results are very robust. Therefore, we only report the results for the full sample based on NAICS codes where available (i.e., from 1990 to 2004) and SIC otherwise.

dicate that once a firm is functionally diversified, geographic diversification is associated with a reduction in the discount. For functionally-focused firm-years, the discount associated with geographic diversification is significant at the 10% level although economically small. In addition, the difference between geographically-diversified and geographically-focused firm-years is insignificant for functionally-focused firm-years.

4. Multivariate Regression Analysis

To investigate whether the benefits of geographic diversification outweigh its costs, we estimate pooled time-series cross-sectional regressions of excess value on our measures of geographic and functional diversification and a number of control variables. To eliminate a potential omitted-variables bias and control for the effect of unobserved variables that are constant over time, as well as unobserved variables that are constant over firms, we include calendar-year dummy variables and firm fixed effects (the coefficients are not reported in the tables). Since the observations for a specific firm (for different years) are clearly not independent (within correlation), we compute cluster-robust standard errors and treat each firm as a cluster.

We include three control variables in our standard regression specification. The natural logarithm of total assets, *ln(Assets)*, is included to cover the possibility that the observed differences in firm value are due to differences in efficiency between small and large firms rather than to the degree of diversification. The second control variable, *Leverage*, might affect firm value based on the role of debt in helping to discourage the overinvestment of free cash flow by self-serving managers (e.g., Jensen, 1986; Stulz, 1990; Hart and Moore, 1995). Debt can also create value by giving the management an opportunity to signal its willingness to distribute cash flows and to be monitored by lenders. Based on simple valuation models, we additionally include the return on assets as a measure of firm profitability. Due to data

availability, we do not include past growth in sales (assets), which is calculated as the average annual growth of sales (assets) over the past three years, to control for growth opportunities. The sample size would substantially decrease resulting in 2,487 (2,493) firm-year observation on 456 (456) firms. However, in unreported tests, we find our results to be very robust to the inclusion of these additional control variables (and the resulting sample reduction).[11]

The results in Column 1 of Table 3 show that the dummy variable for geographic diversity indicates a small (statistically borderline significant) premium, on average, while the coefficient on functional diversification is negative and significant at the 5% level indicating a discount of 12.2% associated with functional diversification in financial intermediaries. In Column 2, we additionally include an interaction term between functional and geographic diversification to investigate whether the valuation effect of geographic diversification depends on whether a firm is functionally diversified and vice versa. However, the coefficient on the interaction term is estimated to be insignificant while the coefficient on the dummy variable whether the firm is geographically diversified turns insignificant as well. In contrast, the coefficient on the dummy variable whether the firm is functionally diversified remains qualitatively unchanged.

Consistently, the coefficients on the number of geographic segments in Column 3 and on the percentage of sales from non-domestic operations in Column 4, respectively, are both negative and insignificant while the discount associated with functional diversification remains virtually unchanged. However, the coefficient on the HHI in Column 5 is positive and significant at the 5% level indicating that geographical diversity is value destroying when

[11] In other unreported robustness tests, we include a set of control variables based on the regression specification proposed by Campa and Kedia (2002) including the natural logarithm of total assets (with zero, one, and two lags), profit divided by sales (with zero, one, and two lags), a squared term of the natural logarithm of total assets, leverage, and a dummy variable for inclusion in the S&P 500 Composite index (or alternatively another large cap (financial) index). The inclusion of lagged values leads to a similar reduction in sample size as the inclusion of the past growth in sales and assets. Again, the results are very robust to the inclusion of the additional control variables (and the resulting sample reduction) and are therefore not reported in a table.

there are more geographic regions and the activities are distributed relatively evenly over these regions.[12]

As a next step, we investigate whether the valuation effect of geographic diversification depends on whether a firm is functionally diversified or focused by reestimating the regressions for sub-samples of functionally focused and diversified firms, respectively. The results based on the geographic diversification dummy variable and the sales-based HHI are reported in Columns 6 to 9 of Table 3 and confirm those reported in Columns 1, 2, and 5: When geographic diversification is measured based on the dummy variable, there is no evidence of a discount (Columns 6 and 7). In fact, there is even evidence of a small and borderline significant premium associated with geographic diversification in functionally diversified firms. In contrast, when the HHI is included as a measure of geographic diversification, the coefficient is estimated positive and significant for functionally focused and diversified firms (Columns 8 and 9).[13]

To mitigate potential measurement errors in the proxy variables for geographic diversification, we construct an alternative measure of geographic diversification which combines the information contained in the four alternative measures of geographic diversification. Specifically, we rank all sample firms by each of the four measures and then use the average rank, standardized to values between 0 and 1, as a measure of geographic diversification. However, this average rank is never estimated to be significant (with *p*-values in excess of 0.40 in the full sample as well as the sub-samples of functionally focused and diversified firms). Therefore, we do not report the results in a table for space reasons.

[12] Alternatively, we additionally include interaction terms between functional and geographic diversification in Columns 3 to 5 of Table 3, i.e., we interact the dummy variable whether a firm is functionally diversified with the number of geographic segments, the percentage of sales from non-domestic operations, and the sales-based Herfindahl index. However, the interaction terms are estimated to be insignificant in all three regression specifications while the coefficients on functional diversification, geographic diversification, and the control variables remain qualitatively unchanged. Therefore, we do not report the results in a table.

[13] The results based on the number of geographic segments and the percentage of sales from non-domestic operations are also consistent with those obtained for the full sample in Columns 3 and 4: All four coefficients are estimated insignificant. Therefore, we do not report them for space reasons.

We also reestimate these regressions for sub-samples based on the firms' main activity-area within the financial services industry. Our classification of the financial services activity-areas is necessarily based on the SIC and NAICS classification codes. In this analysis, we differentiate the following three main activity-areas within the financial services sector which are by far the largest and account for approximately 98.4% of all observations in our sample: (1) credit intermediation and related activities (NAICS 522, SIC 60/61), (2) securities, commodity contracts, and other financial investments and related activities (NAICS 523, SIC 62), and (3) insurance carriers and related activities (NAICS 524, SIC 63/64). The results in Table 4 show differences in the valuation effect of geographic diversification between different financial sub-sectors. The dummy variable is positive and significant for credit intermediaries and insurance companies indicating a premium associated with geographic diversification (Columns 1 and 5). In contrast, geographically diversified securities firms show a large and significant discount (Column 3). One possible reason for this finding is that markets for credit intermediation and insurance are largely multi-local, whereas the securities sector is heavily globalized and requires successful competitors to link issuers and investors as well as arbitrage markets worldwide. However, for all three main activity-areas, the HHI is estimated positive and significant at the 10% level (Columns 2, 4, and 6), confirming the results in Table 3 that geographic diversification has a negative valuation effect when there are more geographic segments and the activities are distributed relatively evenly over these different geographic regions.

As a final check on the robustness of our results, we account for a potential endogeneity of the diversification decision by estimating instrumental variables regressions (e.g., see Campa and Kedia, 2002; Villalonga, 2004). We use a Durbin-Wu-Hausman (DWH) test (e.g., Hausman, 1978) to assess the endogeneity of the different diversification variables. The test involves a two-stage procedure. In the first stage, the potentially endogenous variables are re-

gressed on all explanatory variables in the excess value regression and a number of instruments. In the second stage, the excess value measure is regressed on the potentially endogenous diversification variable, the predicted values of the potentially endogenous diversification variable obtained from the first-stage regression, and the standard set of explanatory variables. If the predicted diversification variable has significant explanatory power based on a standard *t*-test, this variable is presumed to be endogenous.

The choice of instruments is based on Campa and Kedia (2002) and Schmid and Walter (2008) and includes a dummy variable whether the firm pays a dividend, a dummy variable whether the firm belongs to the S&P500 index, a dummy variable whether the firm is listed at NYSE, the fraction of diversified firms and the fraction of sales accounted for by diversified firms in the industry, median industry Tobin's Q and its lagged value, the number of M&A transactions in a given year (financial sector only), the annual value of completed M&A deals in the financial sector in a given year, and GDP growth and its lagged value. We use the four-digit NAICS (three-digit SIC) codes to identify industries.[14]

The characteristic of a good instrument for diversification is such that it is correlated with the decision to diversify but not with valuation. This set of industry and time characteristics as well as firm specific variables is expected to be correlated with the decision to diversify but not firm value. In particular, as the dependent variable is the firm's value relative to the median firm in the industry in any given year, it is by construction independent of any observable characteristics that affect the value of all firms in a given industry and year in the same manner (see Campa and Kedia, 2002). Hence, we alternatively use only the set of industry and time characteristics as instruments and find the results to remain basically unchanged. We also test whether the instruments are in fact orthogonal to the error term of the respective equation by implementing a Sargan misspecification test (e.g., Sargan, 1964; Davidson and

[14] Data on the number and value of M&A transactions are from Thomson Financial's SDC (Securities Data Corporation) database, and data on GDP growth from NBER.

McKinnon, 1993).[15] The Sargan test cannot be rejected at the 10% level for all tested specifications indicating that the instruments of our system seem to be orthogonal to the error terms.

Applied to each of the diversification dummy variables included in Table 3, the DWH test rejects the null hypothesis of no endogeneity at the 5% level for the dummy variable whether a firm is functionally diversified but cannot reject at the 10% level or better for the different measures of geographic diversification. Hence, we account for the endogeneity of functional diversification by reestimating the regressions reported in Columns 1, and 3 to 5 of Table 3 whereas the dummy variable whether the firm is functionally diversified is instrumented. For the diversification dummy variables, we impose the (nonlinear) functional form of the probit model by regressing in the first stage the diversification dummy variable on all presumably exogenous variables in the excess value regression along with the predicted probability of being diversified – which is obtained from probit regressions of the diversification dummy variables on the instruments. The results from estimating the instrumental variables regressions are reported in Columns 1 to 4 of Table 5. Most importantly, accounting for the endogeneity of functional diversification leaves the main results qualitatively unchanged as compared to Table 3. The coefficient on the alternative measures of geographic diversification is estimated to be insignificant with the exception of the HHI which remains positive and significant in Column 4. However, the coefficient on the dummy variable whether a firm is functionally diversified increases in absolute terms indicating a conglomerate discount of between 35% and 39% as compared to 12% to 15% in Table 3. This finding is consistent with Laeven and Levine (2007) and Schmid and Walter (2008) who both report a substantial increase in the conglomerate discount of financial intermediaries when the endonegeity of the diversification decision is accounted for.

[15] The Sargan statistic is calculated as *N* (sample size) times the R^2 from a regression of the residuals of a 2SLS estimation on all instruments and is asymptotically distributed as a Chi-squared with degrees of freedom equal the number of over-identifying restrictions (the number of instruments less the number of regressors).

We perform a number of robustness checks on these instrumental variables results. First, notwithstanding the results from the DWH-test, we reestimate the regressions in Columns 1 and 4 by additionally instrumenting the variables measuring geographic diversification, i.e., the dummy variable whether a firm is geographically diversified and the sales-based HHI, respectively.[16] The results are reported in Columns 5 and 6 of Table 5 and remain qualitatively unchanged as compared to those in Columns 1 and 4.[17] Second, we directly include all exogenous variables and instruments in the first step regressions (instead of using the predicted probability of being diversified).[18] Third, we identify industries based on three-digit NAICS (two-digit SIC) codes. Finally, we vary the instruments in the first step of all instrumental variables specifications, for example by including a dummy variable whether the firm is included in the S&P financial instead of the S&P500 index or by including lagged values of the log of total assets and return on assets. In all tested specifications, the results remain qualitatively unchanged and indicate a significant discount associated with functional diversification while the coefficient on geographic diversification is estimated to be insignificant (with the exception of the HHI which remains positive and significant). Therefore, we do not report the results for reasons of brevity.

5. Conclusions

From the perspective of shareholders, financial services firms presumably diversify geographically for a number of reasons. Logic suggests that these include (1) obtaining access to large and growing non-local markets into which the firm can leverage its competitive advantages and achieve excess risk-adjusted returns for a sufficient period of time to make it

[16] When instrumenting the sales-based HHI, we directly include all presumably exogenous variables in the first-stage regression and then use the predicted values from this regression as additional explanatory variable in the second stage.
[17] In unreported tests, we also instrument the number of geographic segments as reported on Compustat and the percentage of sales from non-domestic operations besides the functional diversification dummy variable.
[18] This latter model does not impose the (nonlinear) functional form of the probit model.

attractive in a capital-allocation context; (2) achievement of scale economies or X-efficiencies that would not be possible in the absence of a broad geographic platform; (3) diversification gains associated with revenue streams from different macro environments and currencies that are not perfectly correlated; or (4) serving clients which are themselves geographically diversified or operate in functionally globalized markets that require seamless intermediation or proprietary trade execution. These gains presumably outweigh the increased information costs, contracting costs, regulatory burdens and complexity that may be associated with geographic diversity. In balancing these considerations, a number of commercial banks have become highly diversified geographically, including Bank of America and Wachovia in the U.S., Unicredit and Santander in Europe, as well as Citigroup and HSBC globally, among many others. In insurance, global players such as AIG, Allianz and AXA have emerged in both the life and nonlife sectors, while reinsurance firms such as Swiss Re have traditionally served global markets. And among broker-dealers the four remaining independent banks (Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley) as well as the investment banking divisions of financial conglomerates such as Credit Suisse, Deutsche Bank, and JP Morgan Chase all have broad geographic operations linking the major financial hubs with spokes into pockets of issuer and investor activity as well as financial advice and principal investing. The question is whether the observed high degree of geographic diversification has in fact been accretive from the perspective of the shareholders of financial firms.

Our results show that geographic diversification in general is not in fact associated with a valuation discount. Indeed, the results based on the Herfindahl-Hirschman index show that geographic diversity is value-destroying when there are more geographic segments and the activities are distributed relatively evenly over these segments. The inference is that the vast majority of financial services are multi-local, that sustainable competitive advantages from scale economies and X-efficiency, as well as transfers of product and process technolo-

gies, are limited in the financial services sector. Local firms seem to hold their own very well in terms of their valuation. The one exception appears to be investment banking, a likely product of globalization of debt and equity markets and of investment banking clients themselves.

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Table 1: Sample overview by calendar year

Year	Focused	Focused (%)	Diversified	Diversified (%)	N
1985	14	29.79%	33	70.21%	47
1986	23	16.31%	118	83.69%	141
1987	30	19.74%	122	80.26%	152
1988	29	19.33%	121	80.67%	150
1989	32	22.22%	112	77.78%	144
1990	29	22.31%	101	77.69%	130
1991	31	20.53%	120	79.47%	151
1992	33	18.54%	145	81.46%	178
1993	44	18.41%	195	81.59%	239
1994	50	18.52%	220	81.48%	270
1995	51	17.41%	242	82.59%	293
1996	54	17.03%	263	82.97%	317
1997	56	18.42%	248	81.58%	304
1998	111	43.36%	145	56.64%	256
1999	107	76.43%	33	23.57%	140
2000	106	79.10%	28	20.90%	134
2001	103	75.18%	34	24.82%	137
2002	98	75.38%	32	24.62%	130
2003	98	74.81%	33	25.19%	131
2004	98	72.59%	37	27.41%	135
Sum	1,197		2,382		3,579

This table reports the number and percentage of geographically focused firms in the sample, the number and percentage of geographically diversified firms in the sample, and the number of total observations (*N*) in this section for each sample calendar year. All firms reporting more than one geographic segment in Compustat's Segment Files are classified as geographically diversified.

Table 2: Descriptive analysis: Functional versus geographical diversification

	Functionally focused	Functionally diversified	Difference	Total Obs.
Geographically Focused	-0.002 (-0.073) [676]	-0.210 *** (-7.824) [521]	0.208 *** (5.926)	1,197
Geographically Diversified	-0.029 * (-1.945) [1508]	-0.106 *** (-5.339) [874]	0.077 *** (3.029)	2,382
Difference	0.028 (1.006)	-0.104 *** (-3.136)		
Total Obs.	2,184	1,395		3,579

This table reports a cross-tabulation of functional and geographical diversification. All firms reporting more than one functional (geographic) segment in Compustat's Segment Files are classified as functionally (geographically) diversified. The table reports the sales-based excess value measure. The *t*-values (in parentheses) are based on a standard two-sided *t*-test and a standard *t*-test for differences in means, respectively. The number of observations in each sub-category is reported in square brackets. ***/**/* denotes statistical significance at the 1%/5%/10% level.

Table 3: Fixed effects regressions of the excess value measure based on sales

Dependent Variable: Excess Value based on Sales	All Firm-Years					Focused	Diversified	Focused	Diversified
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	0.160	0.175	0.244	0.252	-0.291	0.091	-0.097	-0.561	-0.712
	(0.850)	(0.932)	(1.291)	(1.390)	(-1.036)	(0.412)	(-0.247)	(-1.522)	(-1.432)
Funct. Diversified	-0.122 **	-0.150 **	-0.127 **	-0.127 **	-0.122 **				
	(-2.435)	(-2.161)	(-2.566)	(-2.569)	(-2.452)				
Geogr. Diversified	0.058 *	0.041				0.062	0.091 *		
	(1.687)	(0.918)				(1.374)	(1.835)		
Funct. Diversified x		0.043							
Geogr. Diversified		(0.693)							
# of Geogr. Segm.			0.003						
			(0.115)						
% of Foreign Sales				-0.030					
				(-0.250)					
Geogr. HHI (Sales)					0.505 **			0.733 ***	0.634 **
					(2.519)			(2.714)	(2.095)
ln(Assets)	0.031	0.031	0.024	0.024	0.035	0.053 **	0.055	0.053 **	0.070 *
	(1.347)	(1.335)	(1.087)	(1.104)	(1.605)	(2.000)	(1.205)	(2.038)	(1.776)
Leverage	-0.617 ***	-0.617 ***	-0.618 ***	-0.623 ***	-0.642 ***	-0.724 ***	-0.751 *	-0.751 ***	-0.790 *
	(-3.107)	(-3.107)	(-3.147)	(-3.154)	(-3.292)	(-3.377)	(-1.671)	(-3.550)	(-1.914)
ROA	0.068	0.074	0.106	0.101	0.072	-0.161	1.388	-0.154	1.371 *
	(0.253)	(0.278)	(0.390)	(0.368)	(0.266)	(-0.537)	(1.540)	(-0.517)	(1.716)
R-squared (within)	0.030	0.030	0.028	0.028	0.033	0.029	0.040	0.036	0.046
Geogr. Div. Firm-Years	2,382	2,382	2,382	2,374	2,371	1,508	874	1,500	871
Firms	620	620	620	619	619	474	280	473	279
N	3,574	3,574	3,574	3,566	3,563	2,179	1,395	2,171	1,392

This table reports estimates from fixed effects regressions of the excess value measure based on sales on a dummy variable whether a firm is functionally diversified, alternative variables for geographic diversification, and control variables. The measures of geographic diversification are: a dummy variable whether a firm is geographically diversified, the number of geographic segments reported on Compustat, the percentage of sales from non-domestic operations, and a sales-based Herfindahl index. Columns 1 to 5 report results for all firm-years and Columns 6 to 9 for functionally focused and diversified firm-years separately. The standard errors (in parentheses) are based on the cluster-robust variant of the Huber-White sandwich estimator, which accounts for the dependence of observations within clusters (different year-observations for one specific firm). ***/**/* denotes statistical significance at the 1%/5%/10% level.

Table 4: Fixed effects regressions of the sales-based excess value measure for sub-samples based on the firms' main financial sector

Dependent Variable: Excess Value based on Sales						
Financial Sector:	Credit	Credit	Securities	Securities	Insurance	Insurance
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-1.000 **	-1.031	-0.206	-1.366 **	0.631 **	0.456
	(-2.384)	(-1.563)	(-0.678)	(-2.066)	(2.211)	(1.224)
Funct. Diversified	-0.168 *	-0.178 **	-0.268 **	-0.264 **	-0.123 **	-0.129 **
	(-1.938)	(-1.991)	(-2.168)	(-2.061)	(-2.581)	(-2.484)
Geogr. Diversified	0.147 *		-0.147 **		0.082 **	
	(1.774)		(-2.120)		(2.232)	
Geogr. HHI (Sales)		0.665 *		0.861 *		0.500 *
		(1.720)		(1.759)		(1.884)
ln(Assets)	0.130 ***	0.106 **	0.011	0.053	0.014	0.008
	(2.703)	(2.442)	(0.255)	(1.235)	(0.481)	(0.273)
Leverage	0.038	-0.028	0.325	0.295	-1.168 ***	-1.177 ***
	(0.110)	(-0.086)	(1.059)	(1.041)	(-3.153)	(-3.212)
ROA	-0.649	-0.483	-0.379	-0.547	0.861 *	0.882 *
	(-1.210)	(-0.899)	(-0.876)	(-1.244)	(1.719)	(1.717)
R-squared (within)	0.060	0.048	0.043	0.051	0.100	0.098
Geogr. Div. Firm-Years	464	463	462	461	1,428	1,419
Firms	151	151	121	120	325	325
N	658	657	687	686	2,173	2,164

This table reports estimates from fixed effects regressions of the excess value measure based on sales on a dummy variable whether a firm is functionally diversified, a dummy variable whether a firm is geographically diversified (and alternatively a sales-based Herfindahl index constructed for geographic segments), and control variables for sub-samples based on the firms' main financial activity area. The standard errors (in parentheses) are based on the cluster-robust variant of the Huber-White sandwich estimator, which accounts for the dependence of observations within clusters (different year-observations for one specific firm). ***/**/* denotes statistical significance at the 1%/5%/10% level.

Table 5: Instrumental variables regressions of the sales-based excess value measure

Dependent Variable: Excess Value based on Sales						
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.409	-0.362	-0.413	-0.793 **	-0.427	-1.092
	(-1.413)	(-1.248)	(-1.423)	(-2.293)	(-1.426)	(-1.158)
Funct. Diversified	-0.381 **	-0.354 **	-0.388 ***	-0.390 **	-0.394 **	-0.424 ***
	(-2.519)	(-2.306)	(-2.599)	(-2.469)	(-2.295)	(-2.725)
Geogr. Diversified	-0.021				0.038	
	(-0.485)				(0.087)	
# of Geogr. Segm.		-0.043				
		(-1.524)				
% of Foreign Sales			-0.012			
			(-0.108)			
Geogr. HHI (Sales)				0.584 **		0.745 ***
				(2.566)		(2.887)
ln(Assets)	0.121 ***	0.122 ***	0.122 ***	0.127 ***	0.122 ***	0.134 ***
	(3.039)	(3.103)	(3.029)	(3.221)	(2.987)	(3.258)
Leverage	-0.621 ***	-0.632 ***	-0.620 ***	-0.637 ***	-0.619 ***	-0.599 ***
	(-2.812)	(-2.875)	(-2.789)	(-2.896)	(-2.745)	(-2.689)
ROA	0.044	0.051	0.032	0.013	0.022	0.012
	(0.168)	(0.193)	(0.122)	(0.048)	(0.070)	(0.046)
R-squared (within)	0.064	0.065	0.063	0.069	0.063	0.066
Geogr. Div. Firm-Years	2,336	2,336	2,328	2,325	2,336	2,325
Firms	613	613	612	612	613	612
N	3,508	3,508	3,500	3,497	3,508	3,497

This table reports estimates from instrumental variables regressions of the excess value measure based on sales. In Columns 1 to 4 only the dummy variable measuring functional diversification is instrumented. In Columns 5 and 6, both the functional diversification dummy variable as well as the measures of geographic diversification, a dummy variable whether a firm is geographically diversified (Column 5) and a sales-based Herfindahl index (Column 6), are instrumented. The first-stage regressions (not reported) include the following explanatory variables/instruments: the log of total assets, leverage, a dummy variable whether the firm pays a dividend, return on assets, dummy variables whether the firm belongs to the S&P500 index and whether it is listed at NYSE, the fraction of diversified firms and the fraction of sales accounted for by diversified firms in the industry, median industry-Q and its lagged value, the number of M&A transactions in a given year (financial sector only) and the annual value of completed deals, and GDP growth and its lagged value. The second-step regressions include firm and year fixed effects (not reported). The standard errors (in parentheses) are based on the cluster-robust variant of the Huber-White sandwich estimator, which accounts for the dependence of observations within clusters (different year-observations for one specific firm). ***/**/* denotes statistical significance at the 1%/5%/10% level.