The Risks and Returns Associated with the Insurance Activities of Foreign Subsidiaries of U.S. Banking Organizations

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Economics and Policy Analysis Working Paper 2000-8

September 2000

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Abstract

In late 1999, U.S. banking organizations were granted permission to indirectly engage in insurance underwriting by affiliating with insurance companies in a holding company framework. To date, however, few such combinations have occurred and so little empirical evidence on the actual benefits of this sort of merger exists. Most of the available empirical evidence on the risks and returns of bank involvement in insurance activities is drawn from studies examining only hypothetical mergers of banks and insurance companies. Although some U.S. banks have begun to sell insurance products domestically in recent years, there have been virtually no studies of the actual risks and return of this activity because banks are not required to report information on this individual line of business.

But U.S. banking organizations have been permitted to sell insurance and underwrite life insurance outside the U.S. through foreign subsidiaries and file financial statements for each of these subsidiaries with the Federal Reserve. The primary aim of this study is to use these data over a 13-year time span (1987-1999) to generate evidence on the risks and return actually associated with bank controlled insurance operations. This exercise should provide needed insight on the likely effects of an increase in domestic insurance activities by U.S. banks.

Although the results are somewhat sensitive to the aggregation method employed, the evidence is basically consistent with the findings reported in previous work where only hypothetical bank-insurance combinations were analyzed. When ROA is used as the measure of returns, the mean and median returns earned in insurance activities exceed banking returns as well as the returns earned in other nonbanking activities by a substantial margin. When ROE is used to measure returns, the pattern is more mixed because equity-asset ratios in insurance activities are much higher than they are for the two benchmark activities. The evidence generally shows that when viewed on a stand-alone basis, insurance activities are slightly riskier than banking but less risky than the other nonbanking activities BHCs have been permitted to engage in. The results of an analysis of simple two-asset portfolios (banking and insurance) suggest banking organizations can improve, or at least not unfavorably alter their risk/return opportunities by engaging in both banking and insurance activities.

The opinions expressed in this paper are those of the author and do not necessarily represent those of the Office of the Comptroller of the Currency, the Department of the Treasury, or their staffs. The author would like to thank Jack Currie for editorial assistance.

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I. Introduction

In recent years, U.S. banking organizations have sought broader domestic insurance powers. During the 1990s, a number of regulatory and legal decisions lowered barriers to the domestic sale of a broad array of insurance products by banks.[1] But the general prohibition on domestic insurance underwriting by U.S. banks remained in place until late 1999, when the Gramm-Leach-Bliley Act was passed. This law allowed banking organizations to indirectly engage in insurance underwriting by affiliating with insurance companies in a holding company framework.[2] But to date, there have been few such combinations and so there continues to be little empirical evidence on the actual benefits of the combination of banks and insurance underwriters.

Supporters of expanded insurance activities typically cite a number of potential benefits for participating banks, with the opportunity to boost the returns or lower the risk of the banking organization chief among them. Consumer benefits in the form of lower prices or greater convenience are another possible result from bank entry into insurance activities. Opponents emphasize potential problems such as the possibility that insurance underwriting activities could increase bank risk or could permit banks to exploit consumers by tying the sale of insurance and the provision of credit.

Most of the available empirical evidence on the risks and returns of bank

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[1] These include the 1995 Supreme Court VALIC decision [Nationsbank of North Carolina, N.A. v. Variable Annuity Life Insurance Co., 115 S. Ct. 810 (1995)] and the 1996 Barnett Bank decision [Barnett Bank of Marion County, N.A. v. Gallagher, 116 S. Ct. 1103 (March 26, 1996)].

[2] The Gramm-Leach-Bliley Act (Public Law 106-102), was signed on November 12, 1999.

involvement in insurance activities is drawn from studies that examine only hypothetical mergers of banks and insurance companies, since such combinations have not been legally permissible in the past. Although some U.S. banks have begun to sell insurance products domestically in recent years, there have been virtually no studies of the actual risks and return of this activity because banks are not required to report information on this individual line of business.

But U.S. banking organizations have long been permitted to sell insurance and underwrite life insurance outside the U.S. through foreign subsidiaries and are required to file financial statements for each of these subsidiaries with the Federal Reserve.[3] A modest number of U.S. banking companies have engaged in such insurance activities over the past decade. The primary aim of this study is to use these data to generate evidence on the returns and risks actually associated with bank-controlled insurance operations. These data are examined over a 13-year time span (1987-1999). This exercise should provide needed insight on the likely effects of an increase in domestic insurance activities by U.S. banks.

Although the results are somewhat sensitive to the aggregation method employed, the evidence based on the analysis of performance data for insurance operations actually controlled by banks are basically consistent with the findings reported in previous work where only hypothetical bank-insurance combinations were analyzed. When return on

[3] Since at least 1984, the Federal Reserve Board has permitted U.S. bank holding companies to acquire foreign entities that underwrite life insurance to non-residents. The Board requires that these entities be organized as holding company affiliates and that the holding company parent deduct affiliate capital from their own. For an example of this sort of application, see Federal Reserve (1984).

assets is used as the measure of returns, the mean and median returns earned in insurance activities exceed banking returns as well as the returns earned in other nonbanking activities by a substantial margin. When return on equity is used to measure returns, the pattern is more mixed because equity-asset ratios in insurance activities are much higher than they are for the two benchmark activities.

The evidence generally shows that when looked at on a stand-alone basis, insurance activities are slightly riskier than banking but less risky than other nonbanking activities holding companies have engaged in. An analysis of simple two-asset portfolios (banking and insurance) using the risk and return estimates from this study suggest banking organizations can improve, or at least not unfavorably alter their risk/return opportunities by engaging in both banking and insurance activities.

The remainder of the paper is organized as follows: In the next section, several important data issues are discussed. In the third section, several of the most recent empirical studies investigating the likely impact of bank expansion into insurance activities are reviewed. In the fourth section, estimates of the risks and return of overseas holding company insurance activities are presented and analyzed. A summary of the findings and conclusions follow.

II. Data Issues

The main data sources used in the paper are the financial reports U.S. banking

organizations must file for each foreign subsidiary with the Federal Reserve Board.[4] Since only a few larger subsidiaries file quarterly, this study uses annual year-end financial data to increase the number of insurance subsidiaries in the sample. The level of reporting detail in the required reports varies with the asset size of the individual subsidiary. Insurance subsidiaries with more than $1 million in total assets are included in the sample since only foreign subsidiaries above this threshold file reports that include total assets, total equity, and total net income, the elements needed to compute accounting rate of return on assets and equity. All foreign insurance subsidiaries with non-missing data for these three data items in any year are included in the sample. The 1987 starting point and 1999 ending point of the study reflect the availability of foreign subsidiary data.

Each foreign subsidiary reports a single primary activity code, and this code is the basis for the activity classifications used in this study. Subsidiaries with two insurance-related primary activities are included in the sample. These activities are "insurance underwriting" (basically life insurance underwriting) and "insurance agency/brokerage."[5] These activity classifications are inherently imprecise for several reasons. One is that individual subsidiaries may engage in a number of different activities in addition to their primary one, and the extent to which they do so is not explicitly revealed. Subsidiaries can also change their reported primary activity over time as the nature of their business changes. Examination of the sample data revealed several instances of changes in a

[4] These reports are designated FR2314.

[5] Federal Reserve Board Regulation K constrains the activities of foreign subsidiaries of U.S. banking organizations. As of year-end, 1999, insurance underwriting activities were limited to underwriting life insurance to non-residents.

subsidiary's reported primary activity classification over time, suggesting that some subsidiaries actually engaged in both sorts of insurance activities in one or more years. Because of the imprecision of the insurance activity classifications, risk and return measures are calculated for insurance underwriting separately, and also for the combination of insurance underwriting and agency/brokerage activities.

The available subsidiary-level data can be used to generate two different sorts of activity risk and return measures that reflect differences in the way the data are aggregated. One possible approach is to aggregate the subsidiary-level data by activity to produce a time series of aggregate or industry return measures that are then used as the basis for estimates of expected activity returns and risks. The industry financials resulting from this method of aggregation weight the performance of larger subsidiaries in each activity more heavily. This approach has been used in a number of previous studies where only industry-level data were available to the authors.[6]

An alternative approach is to aggregate the subsidiary level data by activity to the parent holding company level, producing time series' of activity return measures for each individual holding company in the sample. This holding company-level data can then be used to construct several different estimates of overall activity returns and risks. One possible approach is to derive estimates of activity returns (means or medians), return variability, and return correlations or Z score risk measures using the pooled data set of individual holding company observations directly. An advantage of this approach is that

[6] This is the approach used in Wall, Reichert and Mohanty (1993).

it may be the only way to obtain measures of activity risk and return with sufficient degrees of freedom to permit meaningful statistical analysis. A disadvantage of this approach is that the measures of activity returns and risks may be biased if return distributions vary substantially across companies.

Another variant of this approach uses a two-stage process to generate risk and return estimates. First, company-specific estimates of activity return, return correlations and risk are obtained from each company's time series of returns, yielding distributions of each measure. Then averages or medians of these company-specific distributions are used as the measures of expected activity risks and returns. Although this approach avoids possible biases associated with pooling, it can result in expected return and risk measures for activities based on a small number of observations.

Some have argued that there are advantages to using industry data in estimating the expected future distribution of returns for an activity.[7] This sort of aggregation may yield superior estimates of the future distribution of returns to a particular activity by weighting the experience of possible outlier firms with a low level of involvement in the activities of interest less heavily. But others argue that the risk and return measures generated in this way may mask company-specific performance differentials and yield estimates of activity expected returns, variance of returns, and return correlations across activities that differ substantially from those resulting from activity financials derived

[7] In Wall, Reichert and Mohanty (1993), p.6, the authors state that this is the case if within-industry differences primarily arise from regional economic conditions and if firms within the industry are combining across regions. It also reduces the likelihood of spurious results in the formation of portfolios to investigate diversification effects.

using firm-level data.[8] In particular, measures of activity risks tend to be considerably higher and return covariability estimates tend to be lower when firm-level data are employed.

Since the measures of activity risks and returns are likely to be sensitive to the estimation method employed, and because none of the methods are clearly superior, results are reported using all three of these approaches.

It should also be noted that all of the findings reported in this paper are based on analysis of accounting rates of return, with reported after-tax foreign subsidiary net income in the numerator. This is problematic for several reasons. One is that financial firms may choose to influence accounting net income in several ways. For example, some firms may prefer to smooth reported net income over time. Most of the foreign subsidiaries are part of large holding company organizations, and do some, possibly much, of their business with related entities. Intra-company transactions give the parent company the ability to influence where net income is booked within the corporation. Accounting measures of total assets and equity also can be poor proxies for their economic counterparts. In short, the reported profitability of individual foreign subsidiaries may be an imperfect measure of the true returns earned in the reported primary activity. Accounting data are used here, as they have been in most of the related

[8] See Boyd, Hanweck, and Pithychariyakul (1980). They found estimated activity mean returns changed considerably and even differed in sign when firm-level rather than industry-level data were used. They also found that the average of the firm-level activity return standard deviations were many times larger than comparable industry-level standard deviation of returns and that the absolute value of return correlations decreased appreciably if firm-level rather than industry-level data are used. See also Kwast (1989), pp. 118-121 for evidence on this issue.

studies, because there is no better alternative.

III. Review of Studies of the Effects of Combining Banking and Insurance

Estimates of the likely risk effects of allowing banks to enter into various types of insurance activities are presented in a number of previous studies. These studies differ widely in the sort of data, risk measures, and analytical approaches used as well as the time periods examined. Since banks are generally barred from domestic insurance underwriting and do not report financials for insurance agency activities separately, no previous study uses data reflecting the performance of bank-owned insurance operations. Only three such studies are examined here. These three studies were chosen because they illustrate the most common analytical approaches, and are based on different sorts of relatively recent data. Thus, the findings can serve as a useful benchmark for the results reported here.

The first of the studies examined is that of Brewer, Fortier and Pavel (1988). In this paper the authors use firm-level daily stock returns to measures activity risks, using a sample of more than 300 nonbank and 170 banking firms. They classify each of these firms into one of 14 different activity classifications – banking, five permissible and eight impermissible nonbank activities.[9] The impermissible activities include insurance agents

[9] Permissible (for banks directly or holding company subsidiaries) nonbank activities are consumer finance, commercial finance, mortgage banking, consumer credit reporting, and leasing. The impermissible activities other than insurance are savings and loan associations, securities broker/dealer, real estate, and management consulting.

and brokers, life insurance underwriters, health/accident insurance underwriters and property/casualty insurance underwriters. The return data for the individual firms are pooled over 1980, 1982, and 1986. They do not report any measures of activity returns in their paper. They use the variance of the average daily stock returns for the sample firms in each activity to measure stand-alone risk. Using this measure, banking is the least risky of all of the activities examined with a variance of 0.22. Of the 13 nonbank activities examined, insurance agents and brokers rank first in terms of lowest risk (variance of 0.65), property/casualty underwriters rank second (variance of 0.66), life insurance underwriters rank fourth (variance of 1.39) and health/accident underwriters rank eleventh (variance of 3.67). These risk rankings imply that at least the first three types of insurance activities tend to be less risky than permissible nonbank activities over the three years examined.

For each nonbank activity, the authors also calculate the correlation coefficient between the average returns of the firms in that activity and the average returns of banking firms. The correlations for each of the insurance activities are all positive and less than 0.67 with a median value of 0.35. Comparable median values are 0.38 for permissible activities and 0.46 for the non-insurance impermissible activities.

The authors then estimate the likely risk effects of bank participation in these activities by calculating the risk or return variance of pair-wise combinations of "representative" bank and nonbank firms, using their estimated activity return variances and corresponding estimates of return correlations. They report return variances for three

sets of portfolios assuming alternatively, that the representative nonbank firm accounts for 5 percent, 10 percent or 25 percent of the total portfolio. Of those examined, the only activities that result in a portfolio with lower risk than banking alone at any of the percentage thresholds are insurance agents and brokers and life insurance underwriters. This effect is evident at both the 5 percent and 10 percent nonbank investment levels.

A second study that provides insight on the potential effects on bank involvement in insurance activities is that of Wall, Reichert and Mohanty (1993). Here the authors use activity returns and risk measures for 23 different industry groups based on IRS industry aggregate data. Four insurance-related activities are among the industries examined: life insurance, mutual insurance (other than life), other insurance, and insurance agents and brokers. They calculate an expected returns measure, mean return on assets (ROA), for each activity over the 1981-1989 period.[10] At 0.26 percent, bank mean ROA is relatively low, ranking 15th out of the 23 industries examined. Mean returns for all of the insurance categories are higher than that of banking, but in most cases not substantially higher. The mean ROA values are 0.60 percent (11th highest) for life insurance, 0.39 percent (13th highest) for mutual insurance, 0.62 percent for other insurance (10th highest), and 3.73 percent for insurance agents and brokers (3rd highest).

They use a relative risk measure, the coefficient of variation of return on assets (CVROA), as their indicator of activity risk.[11] Over the 1981-1989 period, bank holding

[10] They also replicate all of their analysis using data for the 1974-1980 period.

[11] The coefficient of variation of a return measure is formed by dividing the standard deviation of returns by the mean level of returns.

company CVROA is 0.346, the third lowest of all activities examined. The CVROA of the insurance-related activities from lowest to highest are .545 for insurance agents and brokers (8th lowest), .830 for life insurance (11th lowest), 1.552 for other insurance (16th lowest) and 3.401 for mutual insurance (18th lowest). So on a individual activity basis, the risk of insurance activities generally tends to be higher than the risk of banking. However, as in Brewer, et.al., the risk of insurance activities tends to be lower than that of activities more closely related to commercial banking. Wall, et.al. include six such industries among those examined.[12] The mean CVROA for these six industries is 6.08; the median CVROA is 1.65.

They also use the industry aggregate data to compute return correlations between banking and each of the other activities over the same 1981-1989 interval. All of the bank-insurance return correlations are positive but insignificant. The correlation between bank and life insurance ROA is 0.31 (10th highest), while it is roughly 0.6 for the other three insurance activities.[13] These correlations again tend to be somewhat smaller than those of the more closely bank-related activities.[14]

Using their estimates of activity returns, risk, and return correlations, the authors compute the risk of pair-wise combinations of a representative bank and a firm from each nonbank industry, for six assumed nonbank portfolio percentages.[15] Of the four

[12] These are mutual savings banks, other banks, savings and loans, personal credit institutions, business credit institutions, and other credit agencies.

[13] The ranks are 16th through 18th.

[14] The mean and median return correlations for the six closely related activities are roughly 0.68.

[15] The percentages are five, ten, twenty-five, fifty, seventy-five and ninety.

insurance categories, only the combination of banks and life insurance yields a portfolio with a risk level even roughly equivalent to that of banking alone and this result is evident only at a 5 percent nonbank asset percentage.[16] None of the portfolios involving banks and representative firms from any of the industries more closely related to banking have risk levels less than or equal to banking alone at even the 5 percent portfolio weight.

The authors also use their data to construct efficient portfolios of representative firms from more than two industries.[17] When such portfolios are considered, the authors find greater benefits from bank expansion into insurance activities. For example, they find that a portfolio consisting of banking (54.3 percent), life insurance (13.6 percent), insurance agents and brokers (3.5 percent), and three other activities has an expected return of 1.5 percent (vs. 0.26 percent for banks alone). This same portfolio has an estimated ROA standard deviation of 0.09 percent (the same as that of banking alone) with a CVROA of .06 (vs. .346 for banks alone).[18]

They also constructed efficient portfolios using only bank and the more bank-like activities. In general, they find that combinations of bank and bank-like activities resulted in portfolios with less desirable risk-return trade-offs than portfolios where banks are combined with representative firms drawn from less traditional nonbank industries.[19]

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[16] The CVROA for this portfolio is 0.345.

[17] Efficient portfolios are combinations of two or more activities that have the lowest risk for alternative assumed levels of expected return.

[18] The other industries in this portfolio are commodity broker/dealers (1.7 percent), regulated investment companies (15.1 percent) and real estate subdividers and developers (11.9 percent).

[19] For example, they never found efficient portfolios that had a risk-return configuration superior to a 100 percent bank portfolio.

The final study containing evidence on the effects of bank entry into insurance activities examined is that of Boyd, Graham and Hewitt (1993). In this study, the authors use data for roughly 370 individual firms drawn from banking and six other industries to construct their measures of activity risk and return. They include three sorts of insurance firms: life insurance, property/casualty insurance, and insurance agents and brokers. For each sample firm, they calculate the mean return on average equity over all of the years it existed from 1971 to 1987, using both accounting and market data. Then they use the median of these means for all firms in a given industry as their measure of each activity's expected return. When accounting data are used, banking ranks as the fourth most profitable activity, with a median expected return of 13.2 percent. Insurance agents and brokers, with a median expected return of 19.3, ranked first. Property/casualty and life insurance ranked third and fifth respectively, with median returns of 13.7 and 11.8 percent. When market data are used, median bank returns are 15.9 percent, the third highest of all activities examined. Comparable values for the insurance firms are 18.1 percent for property/casualty firms (ranks 1st), 15.2 percent for insurance agents and brokers (ranks 4th), and 14.0 percent for life insurance firms (ranks 6th). So in this study, the differences in return between banking and insurance appear to be relatively modest.

The authors use an indicator of the likelihood of insolvency called a Z score as their measure of risk.[20] Actually the Z score values and the probability of insolvency are inversely related – higher Z values imply a lower likelihood of insolvency. Estimates of

[20] The construction and rationale for the Z score is discussed further below.

three components are necessary to construct Z scores: expected returns, variability of returns, and the level of equity relative to assets. Higher expected returns, higher capitalization levels, and lower return variability result in higher Z score values and imply lower risk.

The authors derive a Z value for each sample firm, again using both accounting and market data for all of the years for which data are available. To measure the risk of each activity, they use the median Z values for all firms with that activity classification.

Using the accounting version of this metric, banking has the highest median Z value of 31.8, indicating the lowest risk. Life insurance ranks a close second, with a Z value of 28.1. Property/casualty firms are third with a Z value of 19.7, and insurance agents and brokers rank fifth, with a median Z value of 8.6.

When market data are used, the magnitude of the Z values changes considerably, and the differences in medians across activities narrow sharply. In this case, banking is the third least risky activity, with a median Z value of 3.82. Property/casualty firms become the least risky activity, with a Z value of 4.03. Life insurance ranks second, with a Z value of 3.97 and insurance agents and brokers rank fourth, with a Z value of 2.92.

The authors estimate the risk effects of bank expansion into the six nonbank activities by simulating large numbers of pair-wise mergers of a randomly selected bank and nonbank firm in a particular activity, scaling the nonbank firm financials to achieve a specific initial portfolio weight. Combining the financial data of the merging firms for all years in which data for both are available yields time series' of returns and capitalization

for this specific portfolio type. The authors use these time series' to compute the components of the Z score risk measure for that particular type of combination. The process is repeated many times with the same given initial portfolio weight. The process is then repeated after incrementing the initial portfolio weight. This process produces a distribution of Z scores for each possible sort of pair-wise merger, for initial nonbank portfolio weights ranging from 0 to 100 percent.

Inferences about the likely risk effects of bank expansion into the selected activities are drawn by examining changes in the median Z score for the simulated mergers as the initial nonbank portfolio weight increases from 0 percent activity toward 100 percent. Increases in the median Z score as the nonbank portfolio weight increases suggest that bank expansion into a particular activity is likely to reduce risk.

When accounting data are used, combining banks with either life insurance or property/casualty insurance firms show risk-reducing potential. The median Z score for bank-life insurance mergers hits a maximum at a 16-20 percent life insurance portfolio share, and is above the bank-only Z score out to a share of roughly 60 percent. The median Z score for the bank-property/casualty combinations hits a maximum at a nonbank portfolio share of 3-6 percent and exceeds the bank-only median Z score at portfolio shares up to 11 percent. The results are qualitatively the same when market data are used.

A number of conclusions can be drawn from the review of these three studies. Perhaps the most obvious conclusion is that the estimates of the risk and return impacts of

bank expansion into insurance activities are somewhat sensitive to the type of data and analytic methods used and the time period examined. That being said, the findings suggest that expected returns are somewhat higher in insurance activities than they are in banking. The evidence also suggests that insurance activities tend to be riskier than banking when looked at in isolation, although in the case of life insurance underwriting, the risk difference is not great. But the findings also imply that at least a modest level of bank involvement in insurance activities, particularly life insurance underwriting, is unlikely to increase the risk of the banking organization significantly. In fact, the results indicate greater potential benefits from bank expansion into insurance activities than from participation in currently permissible nonbanking activities.

IV. Empirical Estimates of Risk and Return

Table 1 contains aggregate information showing the extent to which U.S. bank holding companies have been involved in insurance activities through foreign subsidiaries, as well as industry-level measures of the profitability and capitalization of these operations. Data on the number of holding companies involved reveal that relatively few have engaged in insurance activities during this interval. In 1999, only eight holding companies had foreign subsidiaries primarily engaged in insurance underwriting. The scale of the insurance activities of these holding companies is also quite modest. The aggregate assets of all insurance underwriting subsidiaries totaled

roughly $4 billion at year-end 1999. The comparable total for subsidiaries engaging in all types of insurance activities was just slightly higher at $4.14 billion. For perspective, this $4.14 billion total is less than 1 percent of the total assets in all foreign subsidiaries of U.S. banks in 1999 as well as the aggregate total assets of the nonbank subsidiaries of the holding companies that had overseas insurance subsidiaries at this time. The low level of involvement suggests that the available data will primarily be useful in providing insight on the *potential* rather than actual impacts of bank participation in insurance activities.

While the current extent of holding company involvement in overseas insurance activities is relatively limited, the growth rate in aggregate insurance assets has been relatively high over the period. The compound annual growth rate for insurance underwriting assets was roughly 23 percent over the 1987-1999 period. A cursory examination of the aggregate annual ROA and ROE numbers in table 1 also suggests that overseas insurance operations of U.S. bank holding companies have been relatively profitable and, in general, highly capitalized.

Descriptive statistics for the industry-level return measures contained in table 1 are presented in table 2 and constitute a first set of activity return and risk estimates. This table also contains similar statistics for two benchmark activities engaged in by the holding companies that operated overseas insurance subsidiaries in each year during the 1987-1999 period. One of these benchmarks is activity conducted in nonbank holding company affiliates other than foreign insurance subsidiaries. This benchmark is an indicator of the returns and risks associated with other sorts of permissible nonbanking

activities. The financial data used to construct these numbers are drawn from the Y-9LP parent-company-only financial reports filed by each holding company with the Federal Reserve.

To illustrate how this return benchmark is calculated, the numerator of the ROA measure for this activity aggregate in any year is the sum of dividends paid to the parent company by all nonbank subsidiaries plus the parent's equity in the undistributed net income of such subsidiaries minus the net income of its foreign insurance subsidiaries, summed over all holding companies with foreign insurance subsidiaries in that year.[21] The denominator is aggregate total assets in all nonbank subsidiaries that are not direct subsidiaries of affiliate banks or Edge Act companies net of insurance sub total assets, summed over the same set of holding companies.[22] Aggregate nonbank ROE and equity-asset ratios are constructed in an analogous fashion.

The same ratios for the other benchmark activity, commercial banking, are constructed in a similar fashion. In this case, the numerator and denominator of each measure are simply aggregates of net income, total assets, and total equity reported by all the bank subsidiaries of the holding companies that operated foreign insurance subsidiaries, drawn from subsidiary bank reports of income and condition in each year. This profitability measure is only a rough indicator of consolidated (in the accounting sense) bank-only profitability because its components reflect transactions with nonbank

[21] A possible problem associated with using this sort of measure of aggregate domestic nonbank net income, noted in Wall (1987), is distortions related to nonbank companies acquired using the purchase method of accounting.

[22] This nonbank asset aggregate is reported as a memo item on the Y-9LPs.

holding company affiliates and any direct bank subsidiaries.

Table 3 contains the descriptive statistics for the same set of ratios but these statistics are calculated using pooled holding company-level data on activity returns. As a result, the statistics reflect sample sizes of 50 or more observations rather than only the 11 years included in the 1987-1999 time period. Table 4 contains the same basic set of information as table 3. But in table 4, the descriptive statistics are averages and medians of company-specific measures of activity mean returns and return variability. These are calculated using only the small number of holding companies that operated overseas insurance subsidiaries in four or more years during the 1987-1999 time period. The arbitrary four-year cutoff is used to yield meaningful company-specific measures of activity return variability.

a. Activity Expected Returns

The first set of indicators of the expected returns associated with each of the examined activities are the mean and medians of the aggregate ROA and ROE values in table 2. The mean and median ROA values for all of the three classes of insurance activities are considerably higher than comparable values for the two benchmark activities. For example, the mean and median ROA values for insurance underwriting are 4.02 and 3.37 percent, respectively. The figures for combined insurance activities are even higher at 4.35 and 3.99 percent because ROAs earned in insurance agency activities

tend to be higher than those in insurance underwriting. Comparable figures for commercial banking are 0.82 percent and 1.00 percent. Mean and median ROA values for nonbanking activities are even lower, at 0.42 and 0.54 percent. Formal tests show that the differences between insurance activity and commercial banking mean and median ROA are statistically significant even with the small number of degrees of freedom available here.[23] Not surprisingly, given the larger apparent differences in ROA, statistical tests also reveal significant differences between mean and median ROA for insurance and other nonbanking activities.[24]

The findings differ somewhat when ROE instead of ROA is used as the measure of expected activity returns. In this case, the mean ROE values for the two insurance activity classifications are above those of commercial banking, while median ROEs are roughly the same. But the differences in measured profitability are typically small and are not statistically different. The lack of more pronounced differences in ROE is primarily attributable to the much higher capitalization levels typical of insurance activities. The mean and median ratio of equity-assets for both insurance activity definitions are roughly 30 percent versus roughly 7.0 percent for the bank and other nonbank activity benchmarks.

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[23] For example, the t-values for differences in mean ROA for insurance underwriting and combined insurance activities versus commercial banking are 7.07 and 9.18, respectively. Both of these values are significant at the 1 percent level. Wilcoxon rank sum tests for differences in median ROAs yield z-values of approximately 4.3, again indicating differences significant at the 1 percent level.

[24] The t-values for differences in mean ROA for insurance underwriting and combined insurance activities versus nonbanking activities are 7.70 and 9.78, respectively. Both of these values are significant at the 1 percent level. Wilcoxon rank sum tests for differences in median ROAs again produce z-values of in excess of 4, again indicating differences significant at the 1 percent level.

The profitability differences again are larger when insurance mean and median ROE are contrasted with those of other nonbanking activities. These differences are also statistically significant.[25]

The mean and median return data in tables 3 and 4 clearly show the potential importance of the method of aggregation in estimating activity returns (and also risks). In table 3, the estimates of returns based on pooled individual holding company ROA data are higher than when industry aggregate data are used for all of the activities examined. For example, the mean and median ROA for insurance underwriting become 6.35 percent and 4.14 percent, respectively versus 4.02 and 3.37 percent when they are calculated using industry-level data. However, mean and median ROA for insurance activities are still considerably above those of the two benchmark activities. The differences in mean and median ROA between each of the categories of insurance activities and commercial banking are all statistically significant.[26]

The same sort of pattern is also evident in table 4. Using either means or medians of holding company-level mean returns, the estimated ROAs are higher for all activities than when aggregate data were used, and insurance ROAs are again considerably higher than those of commercial banking.

Although mean and median ROA for the nonbank benchmark are higher in tables

[25] The t-values for the differences in mean ROE are 2.11 and 2.65 when insurance underwriting and combined insurance activities are compared to other nonbanking activities. The z-values from the rank sum tests for differences in median ROE are 1.77 and 2.59.

[26] The t-values for the differences in mean values are 7.15 and 8.42 for insurance underwriting and combined insurance, respectively. The z-values for the differences in median ROA are 7.56 and 8.19, respectively.

3 and 4 than in the case of aggregate data, they generally continue to be slightly below the comparable values for commercial banking. These differences, however, are not significant.

The pattern of results differs somewhat when ROE based on the pooled data is used to measure return. Unlike the findings for mean activity ROA, mean activity ROEs are not consistently higher in the case of pooled data than they are when calculated using the aggregate data. In addition, insurance activity mean ROEs do not consistently exceed those of commercial banking. For example, the mean and median insurance underwriting ROEs based on pooled data are 12.6 and 10.7 percent in table 3, versus 13.4 and 15.0 percent for commercial banking. In the case of combined insurance activities, the mean ROE is slightly above that of commercial banking while median ROE is slightly below. Again, substantially higher equity capital ratios at insurance subsidiaries are the reason for the lower ROE in insurance activities. In any event, the differences in mean and median ROEs in table 3 are relatively small and statistically insignificant. In the case of the pooled data, when insurance underwriting and other nonbanking activities are compared, the differences in activity mean and median ROEs are small and the pattern is mixed. As in the case of aggregate data, the mean and median combined insurance activity ROE is consistently above the comparable value for other nonbanking activities, but only the former difference is statistically significant ($t=1.95$).

The results obtained using the data in table 4 are generally in line with those based on the data in table 3. The mean and median ROE for insurance underwriting are slightly

below comparable values for commercial banking. But the mean ROE for overall insurance activities is roughly the same as that of commercial banking, while the median ROE is a bit higher. Again, the insurance activity mean ROE is considerably above that of other nonbanking activities but these differences are not significant given the small number of degrees of freedom available in this case.

b. Activity Risks

Information in tables 2, 3 and 4 provides insight on how engaging in insurance activities could affect the risk of participating banking organizations. The crudest indicator of activity risk in each of these tables is return standard deviation. Entry into activities with return standard deviations above those of commercial banking are more likely to increase the risk of banking organizations. In all three tables, the standard deviations of insurance activity ROA are larger than comparable values for commercial banking. This is generally true when the standard deviation of ROE is used as the risk measure, but not in all cases.[27]

But simple comparisons of the return standard deviations of individual activities do not provide enough information to make definitive judgments about the risks of permitting commercial banks to engage in other sorts of financial activities. Simple comparisons of standard deviations of returns ignore any accompanying differences in

[27] See for example, table 2.

mean returns across activities that might compensate for greater risk. Such comparisons also do not take into account any possibly mitigating effects of correlation of returns across activities.

One alternative way to evaluate the potential risk impact of insurance activities is to compare relative risk measures across activities. One indicator of relative risk is the return coefficient of variation, formed by dividing an activity's return standard deviation by the corresponding mean level of returns. Higher coefficient of variation values indicate higher relative risk.

Turning to the aggregate data in table 2 and using ROA as the profitability measure, the coefficients of variation for insurance underwriting and combined insurance activities are .388 and .299, respectively versus .585 and 1.52 for the commercial banking and nonbanking benchmarks. So insurance activities appear to be less risky than banking and other nonbanking activities, using this set of data and profitability measure. Switching to ROE does not alter this conclusion. The two insurance ROE coefficients of variation become .242 and .177 versus .615 and 1.49 for commercial banking and other nonbanking activities.

The results differ when the pooled sample data are used. In table 3, the pooled data result not only in higher estimates of mean ROA, but also in higher estimates of ROA variability. This produces ROA coefficients of variation of .989 for insurance underwriting and .880 for combined insurance activities. Comparable values are .495 for commercial banking and 1.60 for other nonbanking activities. So, using this sort of data,

insurance activities appear to be more risky than commercial banking but still less risky than other nonbanking activities. These results do not change in the case of ROE.

The results are similar if coefficients of variation are constructed from the information in table 4. For example, using the mean commercial bank ROA standard deviation of 0.30 percent as the numerator and the mean of average bank ROA of 0.97 percent in the denominator yields a bank ROA coefficient of variation of .309. The comparable values for insurance underwriting and combined insurance activities are .417 and .431, respectively.

Yet another way to evaluate the potential risk effects of insurance activities is to look at how engaging in such activities might affect a firm's likelihood of insolvency. This can be done by examining Z scores that combine information on the expected returns, return volatility, and equity-asset ratios of alternative activities. The general formula for a Z score measure of the probability of insolvency for activity j is:

$$(1) \quad Z_j = \left(E\left(ROA_j\right) + K_j\right)/\sigma_{ROA,j}$$

where:

$E(ROA_j)$ = the expected ROA for activity j

K_j = the equity-asset ratio for activity j

$\sigma_{ROA,j}$ = the standard deviation of ROA for activity j

If activity ROA is assumed to be normally distributed, the Z score is an estimate of the number of standard deviations below the mean that activity profits would have to

fall before the equity devoted to that activity became negative.[28] This risk indicator is superior to both the return standard deviation and coefficient of variation because it reflects an activity's expected level of returns, the variability of the returns, and also the level of equity capital employed, which can serve to mitigate low or variable profitability. Higher mean ROA, higher capital ratios, or lower ROA standard deviations result in higher Z values. Higher Z values, in turn, reflect a lower estimated risk of insolvency. Thus, non-traditional activities with Z score values greater than the Z score value for commercial banking imply lower overall risk for the banking firm that enters them.

Competing sets of activity Z scores can be obtained by plugging different estimates of the mean activity ROA, the standard deviation of ROA, and equity-asset ratios into equation 1. Using the estimates based on the aggregate data from table 2 produces a Z score of 22.51 for insurance underwriting and 26.42 for combined insurance activities versus 15.88 for commercial banking and 11.13 for other nonbanking activities. This pattern suggests that banks can lower their insolvency risk by engaging in insurance activities. The results obtained using the Z score risk measure illustrate the importance of analyzing risk assessments that incorporate and weigh the opposing effects of return variability, expected returns, and equity capitalization. Note also that the Z scores suggest that other nonbanking activities are likely to pose greater risk to banks than insurance activities

Using comparable activity mean ROAs, equity-asset ratios, and ROA standard

[28] Boyd, Graham and Hewitt (1993) show that Z can be viewed as an upper bound on the probability of insolvency even if ROA is not normally distributed.

deviations based on the pooled data from table 3, however, yields slightly different results. In this case, the Z values for insurance underwriting and combined insurance activities are 10.15 and 10.27, respectively versus 17.02 for commercial banking and 6.88 for other nonbanking activities. This pattern suggests that entry into insurance activities might slightly increase risk for banks. The Z scores again indicate that any increase in risk is less than that posed by other nonbanking activities.

A third way to look at differences in activity Z scores is to examine the means and medians of the company-specific Z scores for the relatively small number of holding companies that engaged in insurance activities for four years or more during the 1987-1999 period.[29] The mean commercial banking Z score for the sample holding companies with insurance operations for four or more years is 42.88.[30] Comparable mean Z values are 34.25 for insurance underwriting, 25.43 for combined insurance operations, and 19.96 for other nonbanking activities. The pattern of median activity Z values is basically the same: 58.15 for commercial banking, 29.11 for insurance underwriting, 23.47 for combined insurance activities, and 13.97 for other nonbanking activities. So the mean and median Z scores of the company-specific activity Z values are in line with the results based on the pooled data. For the typical holding company, insurance activities appear to be slightly more risky than commercial banking but less risky than other nonbanking

[29] Nine holding companies engaged in insurance activities for four or more years over this period. Eight engaged in insurance underwriting for four or more years over this period.

[30] This is the mean of commercial bank Z values calculated separately for each holding company using its respective mean bank ROA, mean bank equity-assets ratio, and standard deviation of bank ROA measured over all years it operated overseas insurance subsidiaries.

activities.[31] The differences in mean and median Z scores for commercial banking vs. insurance underwriting and combined insurance activities, however, are never significant. The differences in mean and median Z scores are also insignificant when insurance activities are compared to other nonbanking activities.

But comparing any of these alternative measures of individual activity risks, including Z scores, ignores possible diversification benefits from combining activities in a single firm.[32] It is possible that activities with stand-alone risk exceeding that of commercial banking could be combined with commercial bank assets in a portfolio that is no more risky than commercial banking alone. The effects of return correlation across activities can be investigated by using the alternative measures of activity risks and returns discussed above to obtain estimates of the returns and risks of hypothetical portfolios with different assumed proportions of banking and insurance assets.

The variance of returns for any two-asset portfolio depends on the variances of the returns in the individual activities but also on the assumed proportion of each activity in the portfolio, as well as the correlation between the activity returns. Formally:

$$(2) \qquad \sigma^2(r_{i,j}) = w_i^2\sigma^2(r_i) + (1-w_i)^2\sigma^2(r_j) + 2w_i(1-w_i)\rho_{i,j}\,\sigma(r_i)\sigma(r_j)$$

[31] The analysis of means and median Z scores masks possible differences across holding companies. For example, the Z score for insurance underwriting activities exceeds the Z score for commercial banking at three of the eight holding companies that engaged in insurance underwriting for four or more years. It also exceeds the Z score for other nonbanking activities at 7 of the 8 sample companies.

[32] Simply comparing activity Z scores does not capture any potential effects of diversification on expected returns or return variability.

where:

$\sigma^2(r_{i,j})$ = the variance of portfolio returns

w_i = the fraction of the portfolio devoted to activity i

$\sigma^2(r_i)$ = the variance of returns to activity i

$\sigma^2(r_j)$ = the variance of returns to activity j

$\rho_{i,j}$ = the correlation coefficient between returns to activity i and activity j

$\sigma(r_i)$ = the standard deviation of returns to activity i

$\sigma(r_j)$ = the standard deviation of returns to activity j

So, in addition to assumptions about the weight of each asset in the portfolio, estimates of the variability of individual activity returns and return correlation are required to generate estimates of portfolio return variability. To construct portfolio coefficient of variation risk measures, corresponding estimates of portfolio expected returns must also be calculated.[33]

Tables 2, 3, and 4 contain three different estimates of activity return variances. Corresponding sets of return correlations can be generated using alternatively, the industry aggregate returns, the pooled holding company returns, or the average or median of the return correlations for the holding companies used to produce the data in table 4.

For example, correlating the industry aggregate activity ROAs in table 2 over the 1987-1999 period yields negative correlations between banking returns and returns in

[33] This is simply sum of the portfolio weight of each asset times the expected return of the asset.

insurance underwriting and combined insurance activities (the correlation coefficients are -0.47 and -0.57, respectively).

The negative correlations suggest that combining commercial banking and insurance can result in diversification benefits for banking organizations.[34] Assuming the ROA mean and standard deviations in table 2 and the associated return correlation of -0.47 characterize the true activity return distributions, a portfolio of 64 percent commercial banking and 36 percent insurance underwriting assets would have the same ROA standard deviation as commercial banking alone (0.50 percent). But this portfolio has an expected return of 1.97 percent versus the commercial banking mean return of 0.82 percent.[35] In the case of a portfolio consisting of commercial banking and combined insurance activities, the insurance activity fraction of the portfolio with risk equivalent to commercial banking alone is even higher.[36]

Diversification benefits are also apparent when activity return variances and correlations based on the pooled data are used, although the size of the benefits are quite small. This finding reflects higher estimated insurance return variability and different estimates of return correlation across activities. When the pooled data are used, the correlation coefficient between insurance underwriting and banking ROA is 0.046. In the case of combined insurance activities versus commercial banking, the correlation is

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[34] In a two asset portfolio, combining banking and a nonbanking activity cannot lower portfolio return standard deviation relative to banking when the return correlation equals one or exceeds the ratio of the standard deviation of banks returns divided by the standard deviation of nonbank returns.

[35] The expected return is [(.36*4.02 percent) + (.64*0.82 percent)].

[36] The equivalent risk portfolio consists of roughly 46 percent insurance activities and has an expected

0.074. Using the 0.046 correlation coefficient along with the activity ROA means and variability measures from table 3 in equation 2, a portfolio with 1 percent insurance underwriting assets and 99 percent commercial banking assets has the same ROA standard deviation as commercial banking alone with a slightly higher return (0.98 vs. 0.90).

Since a 100 percent bank portfolio return standard deviation criterion ignores the possible portfolio return-enhancing effects of higher levels of insurance activities that might offset additional risk, it is also useful to examine the insurance portfolio weight that yields a coefficient of variation equal to banking alone. Using the same risk and return data, a portfolio of 10 percent insurance underwriting assets and 90 percent commercial bank assets has a ROA coefficient of variation equal to that of commercial banking alone.[37]

A similar exercise can be performed with the type of return data reported in table 4. The mean or median values of the ROA correlations for the holding companies that engaged in insurance activities for four or more years during the 1987-1999 period can be used as alternative correlation estimates in equation 1. The mean value of the insurance underwriting – commercial bank ROA correlation for the eight holding companies that performed this activity for four or more years is 0.121. The median value is 0.192. The means or medians of activity standard deviation of ROA can alternatively be used as

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return of 2.44 percent.

[37] The all-bank portfolio has an expected ROA of 0.93 percent and a standard deviation of 0.5 percent implying a coefficient of variation of .538. The 10 percent insurance underwriting, 90 percent commercial banking portfolio has an expected ROA of 1.45 percent and a ROA standard deviation of 0.79 percent.

estimates of stand-alone risk. For example, in table 4 the mean ROA standard deviations are 0.30 percent for banking, 2.80 percent for insurance underwriting, and 3.05 percent for combined insurance activities. The respective medians are 0.2, 2.45, and 2.67. The means or medians of the average ROA figures can be used as alternative estimates of individual activity expected returns.

Using ROA median values for illustrative purposes, the benchmark bank-only portfolio would have an expected return of 0.99 percent, a return standard deviation of 0.2 percent, and a coefficient of variation of 0.202. Again, using median values of the relevant variables, a portfolio consisting of 99 percent commercial bank assets and 1 percent insurance underwriting assets would also have a return standard deviation of 0.2 percent with a slightly higher expected return of 1.02 percent. A portfolio consisting of 98 percent bank assets and 2 percent insurance underwriting assets would have a coefficient of variation approximating that of commercial banking alone.[38] If relevant mean values are used instead, a portfolio with a 98.5 percent bank asset share and a 1.5 percent insurance underwriting asset share turns out to have a return standard deviation equal to a 100 percent bank portfolio (0.3 percent).[39] A portfolio with asset shares of 77 percent banking and 23 percent insurance underwriting assets has a coefficient of variation equal to that of banking alone.[40]

If ROE return measures (and associated return correlations) are used instead, the

[38] The portfolio expected return would be 1.05 percent; the return standard deviation would be 0.212 percent.

[39] The expected return is 1.06 percent.

insurance activity percentage of the portfolio yielding portfolio return standard deviations or coefficient of variation equivalent to a bank-only benchmark tend to be considerably higher. For example, using the statistics drawn from table 3, a portfolio comprised of 35 percent banking and 65 percent insurance underwriting has the same standard deviation of return as banking.[41] A portfolio of 40 percent banking and 60 percent insurance underwriting has a coefficient of variation equal to a 100 percent bank activity portfolio. If activity return on equity statistics are drawn from table 4, insurance activities can comprise even larger percentages of the portfolio without raising risk above bank-only levels.

It is interesting to contrast the return correlations between insurance activities and commercial banking with those between banking and the other nonbanking activities. Until relatively recently, U.S. banking organizations were generally permitted to enter only activities deemed to be "close" to commercial banking. This restriction implies that the variability of returns of these sorts of activities are likely to be similar to, and correlated positively with those of commercial banking. As a result, banks are less likely to realize much in the way of diversification benefits from entry into these businesses. This is the typical conclusion of most previous studies, including those reviewed above. Analysis of both the aggregate and pooled ROA data above suggests that this is the case. In the case of the aggregate ROA data, the return standard deviations of the banking and

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[40] The expected return of this portfolio is 2.29 percent and the return standard deviation is 0.71 percent.

[41] The ROE standard deviation for banking activities is 7.6 percent. The return correlation is 0.084. The expected return of this portfolio is 12.9 percent.

nonbanking benchmarks are quite close and the correlation coefficient between aggregate returns in these two activities is 0.776, significant at the one- percent level.[42] When pooled data are used, the ROA standard deviation of nonbanking activities exceeds that of commercial banking and the ROA correlation coefficient is roughly 0.44, and statistically significant.[43] So the results contained in this study reinforce the general findings of previous researchers, namely that insurance activities are likely to provide greater diversification benefits than the collection of more common nonbanking activities banks have previously engaged in.

V. Summary and Conclusions

This study analyzes performance data for the foreign insurance subsidiaries operated by U.S. banking organizations from 1987-1999 to generate evidence on the returns and risks of insurance activities. More specifically, the results provide insight on the risks and returns associated with underwriting life insurance and insurance agency activities because these are the primary activities reported by the foreign insurance subsidiaries. One basic finding in this study is that only a modest number of holding companies have engaged in insurance operations through foreign subsidiaries through the end of 1999, although the number and level of involvement of bank holding companies

[42] The correlation coefficients between the nonbanking benchmark and insurance underwriting and combined insurance activities are -0.343 and -0.476, respectively.

[43] Again, negative ROA correlations of roughly -0.043 are observed between insurance and nonbanking activities.

have grown over time. A cursory look at aggregate insurance returns over time shows that these operations have generally been profitable.

The evidence of the risk and return impacts of insurance activities actually controlled by banking organizations in this study is basically consistent with the findings reported by other researchers where only hypothetical bank-insurance combinations were analyzed. As noted in previous work, the estimates of activity risks and returns presented here are somewhat sensitive to the data aggregation method employed. When return on assets is used as the measure of returns, the mean and median returns earned in insurance activities exceed banking returns as well as the returns earned in other nonbanking activities by a substantial margin. When return on equity is used to measure returns, the pattern is more mixed because equity-asset ratios in insurance activities are much higher than they are for the two benchmark activities.

The evidence generally shows that when viewed on a stand-alone basis, insurance activities are slightly riskier than traditional banking but less risky than the other nonbanking activities banking organizations are permitted to engage in. Again, as found in previous studies, estimates of activity risk tend to be smaller and return correlations larger, when based on the analysis of industry aggregate data.

More importantly, the results confirm the typical conclusion reported previously. That is, banking organizations are likely to improve, or at least not unfavorably alter their risk/return opportunities by engaging in both banking and insurance activities, particularly life insurance underwriting activities.

Estimates of risk and return are generated for simple two-asset, bank-insurance portfolios. The estimated optimal percentages for insurance activities in this simple sort of portfolio vary considerably depending on the assumed definition of risk and the type of data used to estimate risk and return. Relatively conservative interpretations of the results suggest that modest levels of insurance activities are not likely to significantly increase the risk of banking organizations.

The findings are subject to a number of caveats. One is that the returns and risks of foreign and domestic insurance activities could differ significantly, and so the results here are not useful indicators of the likely risks and returns of domestic insurance activities. In addition, these data basically reflect the returns associated with life insurance underwriting and agency activities. The results are based on the analysis of a relatively small number of data points and so may not be reliable indicators in a statistical sense. On the other hand, the data do reflect the performance of bank-controlled insurance operations over a lengthy time period, rather than hypothetical mergers. Further, previous research suggests that estimates of diversification benefits based on the analysis of simple two-asset portfolios as done here may understate the potential risk-reducing effects associated with expanded bank activities. So while the results are certainly not definitive, they do represent hard empirical evidence on the likely impacts of bank expansion into insurance activities.

References

Boyd, J., G. Hanweck, and P. Pithyachariyakul. “Bank Holding Company Diversification.” *Proceedings From a Conference on Bank Structure and Competition,* Federal Reserve Bank of Chicago (May 1980) 105-121.

Boyd, J, S. Graham, and R. Hewitt. “Bank Holding Company Mergers with Nonbank Financial Firms: Effects of the Risk of Failure.” *Journal of Banking and Finance* 17 (1993) 43-63.

Brewer III, E., D. Fortier, and C. Pavel. “Bank Risk from Nonbank Activities.” *Economic Perspectives*, Federal Reserve Bank of Chicago (July/August 1988) 14-26.

Federal Reserve Board. “Application of Citibank Overseas Investment Corporation to Acquire Citibank Assurance Co, Ltd., London.” *Federal Reserve Bulletin* 70 (1984) 168.

Kwast, M. “The Impact of Underwriting and Dealing on Bank Returns and Risks.” *Journal of Banking and Finance* 13 (March 1989) 101-126.

Wall, L. “Has Bank Holding Companies’ Diversification Affected Their Risk of Failure?” *Journal of Economics and Business* 39 (November 1987) 313-326.

Wall, L., A. Reichert, and S. Mohanty. “Deregulation and Opportunities for Commercial Bank Diversification.” *Economic Review,* Federal Reserve Bank of Atlanta (September/October 1993) 1-25.

TABLE 1

SELECTED INFORMATION ON INSURANCE ACTIVITIES: 1987-1999

INDUSTRY AGGREGATE DATA

Activity:	Insurance Underwriting						Combined Insurance Activities					
Year	#HC	#Subs	TA	ROA	ROE	EAR	#HCs	#Subs	TA	ROA	ROE	EAR
1987	2	3	$262.3	7.27	13.4	54.3	3	9	$280.6	7.15	13.33	53.7
1988	2	3	$319.2	6.9	17.2	40.1	2	5	$323.6	7.02	17.38	40.4
1989	2	5	$512.1	4.77	14.6	32.7	2	13	$536.3	4.58	14.07	32.5
1990	4	8	$696.1	3.37	11.1	30.4	4	12	$1,222.2	4.46	15.24	29.3
1991	4	8	$936.1	2.75	10.5	26.3	4	16	$1,587.9	4.00	15.38	26.1
1992	4	9	$1,155.8	3.19	13.4	23.8	4	20	$2,116.1	3.88	16.54	23.3
1993	5	10	$1,394.4	3.22	16.2	20.0	6	22	$2,362.0	3.13	14.98	20.9
1994	6	10	$2,062.4	2.36	13.6	17.4	7	19	$3,332.6	3.06	14.52	21.0
1995	7	11	$2,727.6	3.38	20.3	16.6	8	22	$4,105.4	3.99	20.85	19.2
1996	8	11	$3,481.9	2.96	9.3	31.9	10	22	$5,144.2	3.52	12.29	28.8
1997	8	13	$3,578.4	3.73	10.6	35.2	9	21	$5,460.4	4.20	14.08	29.9
1998	9	15	$3,080.1	5.22	11.6	45.0	9	28	$4,787.3	3.83	11.40	33.7
1999	8	13	$4,034.0	3.17	10.4	30.5	8	18	$4,141.3	3.67	11.60	31.7

#HC: Number of Holding Companies Owning Foreign Insurance Subsidiaries
#Subs: Number of Foreign Insurance Subsidiaries Operating
TA: Total Assets in millions of $.
ROA: After-tax net income divided by total assets in percent.
ROE: After-tax net income divided by total equity in percent.
EAR: Total equity divided by total assets in percent.

TABLE 2

DESCRIPTIVE STATISTICS FOR KEY PERFORMANCE MEASURES: 1987-1999

INDUSTRY AGGREGATE DATA

Performance Ratio:	**ROA**			**ROE**			**EAR**		
Activity	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Insurance Underwriting	4.02	3.37	1.56	13.20	13.40	3.20	31.10	30.50	10.90
Combined Insurance	4.35	3.99	1.30	14.70	14.60	2.60	30.00	29.30	9.30
Commercial Banking	0.82	1.00	0.50	11.70	14.50	7.20	6.80	7.20	1.02
Other Nonbank Activities	0.42	0.54	0.64	6.90	8.70	10.20	6.70	6.50	1.31

All of the numbers in the table are measured in percentage points.

TABLE 3

DESCRIPTIVE STATISTICS FOR KEY PERFORMANCE MEASURES: 1987-1999

POOLED HOLDING COMPANY-LEVEL DATA FOR ALL SAMPLE COMPANIES

Performance Ratio:	**ROA**			**ROE**			**EAR**		
Activity	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Insurance Underwriting (N=69)	6.35	4.14	6.28	12.60	10.70	10.60	57.40	62.00	33.90
Combined Insurance (N=75)	6.59	4.51	5.83	14.80	14.00	11.00	53.00	44.50	33.40
Commercial Banking (N=75)	0.93	1.03	0.46	13.40	0.15	7.60	6.90	6.80	1.35
Other Nonbank Activities (N=75)	1.03	0.82	1.60	10.10	12.20	17.70	10.00	7.80	8.10

All of the numbers in the table are measured in percentage points.

TABLE 4

DESCRIPTIVE STATISTICS FOR KEY PERFORMANCE MEASURES

MEANS/STANDARD DEVIATIONS OF COMPANY-LEVEL PERFORMANCE MEASURES

DATA FOR ALL SAMPLE COMPANIES w/ 4+ YEARS OF INSURANCE OPERATIONS

Performance Ratio:	**MEAN ROA**			**SDROA**			**MEAN ROE**			**SDROE**			**MEAN EAR**		
Activity	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Insurance Underwriting (N=8)	6.72	3.55	6.40	2.80	2.45	2.07	10.74	8.65	7.95	4.76	4.20	2.61	67.48	72.05	27.73
Combined Insurance (N=9)	7.07	3.77	5.70	3.05	2.67	1.68	13.80	15.10	8.89	5.25	4.20	2.64	60.73	63.60	31.50
Commercial Banking (N=9)	0.97	0.99	0.20	0.30	0.20	0.21	13.87	14.10	2.29	5.04	3.63	4.15	7.00	7.00	0.87
Other Nonbank Activities (N=9)	1.20	0.61	0.96	1.07	0.67	0.93	11.10	13.30	8.29	11.70	8.20	10.40	11.20	7.20	8.95

All of the numbers in the table are measured in percentage points.

MEAN ROA: mean ROA calculated separately for each HC over all years it operated insurance subsidiaries.
SDROA: standard deviation of ROA calculated separately for each HC over all years it operated insurance subsidiaries.
MEAN ROE: mean ROE calculated separately for each HC over all years it operated insurance subsidiaries.
SDROE: standard deviation of ROE calculated separately for each HC over all years it operated insurance subsidiaries.
MEAN EAR: mean EAR calculated separately for each HC over all years it operated insurance subsidiaries.