The Potential for Portfolio Diversification in Financial Services

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THE RECENT PASSAGE OF THE GRAMM-LEACH-BLILEY ACT REWRITES THE RULES RELATING TO THE AFFILIATION OF BANK AND NONBANK FINANCIAL SERVICES PROVIDERS. PREVIOUSLY, RULES HAD SOUGHT TO PREVENT OR AT LEAST RESTRICT COMMERCIAL BANKS' ABILITY TO AFFILIATE WITH INVESTMENT BANKS AND INSURANCE COMPANIES. THESE RULES HAD BECOME

less effective over time as financial firms used advances in information processing and financial technology to avoid the rules by offering products that were functionally equivalent to those that they could not legally provide.[1] The effectiveness of the rules was further diminished as sympathetic regulators reinterpreted prior law to allow their regulatees to enter other parts of the financial services industry.

Nevertheless, the old rules imposed costly restrictions on a bank's ability to provide investment banking and insurance activities. Moreover, they often had the effect of preventing investment banking and insurance firms from owning a commercial bank. The Gramm-Leach-Bliley Act removes most of the impediments to the affiliation of commercial banks with investment banks and insurance companies.

Although the Gramm-Leach-Bliley Act largely eliminates the barriers to affiliation within the financial services industry, it does not necessarily follow that financial supermarkets will come to dominate the financial services industry, as some had predicted.

Any financial conglomerates that emerge must be at least as profitable as firms that focus on specific market segments, and the conglomerates must earn higher risk-adjusted rates of return if they are to dominate. Berger (forthcoming) surveys a large number of existing studies of cost and profit efficiency in the financial services industry to assess the prospects for such financial conglomerates. While pointing out that the available evidence is incomplete in a number of important ways, he concludes that the largest possible gains appear to exist from the greater risk-diversification potential of conglomerates. Conglomerates may exploit the gains from diversification by increasing the proportion of their portfolio invested in higher-return assets—for example, by holding proportionately more loans and fewer securities—without increasing the riskiness of the total portfolio. Thus, assessing the potential of diversification to reduce risk is a potentially important issue in understanding the effect of the Gramm-Leach-Bliley Act on financial conglomeration.[2]

The potential for diversification has been considered in a number of studies. Wall, Reichert, and Mohanty (1993) survey prior studies in this area. They also provide an analysis of the strengths and weaknesses of alternative methodologies, which is adapted here in the box on page 8. In addition, they present new evidence using Internal Revenue Service (IRS) data on industry-level return on assets. They find an emerging consensus that pairwise combinations of individual firms provided insignificant gains from diversification at best and an increase in risk at worse. However, following Litan (1985) and using IRS data over the 1974–89 period, they find gains from forming portfolios of bank and nonbank activities when using IRS rather than individual bank data. Certain portfolios of bank and nonbank activities showed substantially higher returns for lower risk. However, Wall, Reichert, and Mohanty (1993) also find that their results were time-dependent. For example, they find that life insurance was the dominant part of the lowest-risk portfolios in the 1974–80 subperiod whereas it was a relatively small part of those portfolios in the 1981–89 subperiod.

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This article updates the contribution of Wall, Reichert, and Mohanty (1993) in several ways. It begins with a brief review of the literature since 1993. Next, it summarizes the legal changes resulting from the recent passage of the Gramm-Leach-Bliley Act. The article then extends the earlier empirical analysis, first by updating the analysis of the potential gains from diversification using IRS data on return on assets through 1997 and then by extending the diversification analysis to consider profitability as measured by return on equity using IRS data from 1990 to 1997. The article concludes with some speculation about the potential impact of recent technological changes on the benefits of forming financial conglomerates.

Literature Review

Several recent studies have addressed the issue of the benefits and risk associated with bank holding company diversification. Whalen (1999a) examines the overseas insurance activities of U.S. bank holding companies for the period from 1987 to 1997. Since U.S. banks are required to report separately on foreign bank activities, he is able to use the return on assets (ROA) associated with these foreign activities as his measure of performance. Whalen finds that mean returns in insurance activities exceeded the returns to banking as well as the returns on other nonbanking activities by a significant margin. On a stand-alone basis, insurance activities appear to be somewhat riskier than other nonbanking services, but when combined with traditional banking activities the combination can noticeably improve a bank's risk/return opportunities. Whalen concludes that insurance activities that constitute less than 10 percent of a diversified financial firm's total assets should not present a major problem for regulators.

In a similar study (1999b), Whalen examines the foreign securities activities of U.S. banks. Using industry-level data he finds that the average security returns are similar to the returns of traditional banking activities, while measures of risk are somewhat higher. According to firm-level data, average security returns exceeded banking returns by a substantial margin, while security-related risk was higher. However, Whalen concludes that, taking into account the low correlation of foreign investment bank returns with those of their U.S. bank affiliates, overseas securities activities have reduced risk for U.S. banks.

Kwan (1998) studies the relative risk and return associated with both securities underwriting and trading by comparing the performance of bank holding company securities affiliates called Section 20 subsidiaries with their commercial bank affiliates. Kwan finds that those securities subsidiaries tend to be riskier but not always more profitable. On the other hand, the low correlation of securities and bank returns provides some degree of diversification benefits. Kwan concludes that underwriting activities generate likely diversification benefits for both security trading and traditional commercial banking activities.

Two papers expand the focus to examine combinations of banks with financial firms that are currently unaffiliated with banks. Laderman (2000) generates synthetic banks to simulate the entry of both large banks and all banks into eight other types of firms. She finds that all of the activities she examined would reduce bank risk but that in some cases the benefits would occur only at trivial levels of investment in nonbank activities. The largest weights were on firms involved in various aspects of insurance and securities. Allen and Jagtiani (1999) also generate synthetic banks to simulate the impact of both insurance and securities activities. They find that these nonbank activities reduce the

firm's total risk but serve to increase systematic market risk. The authors conclude that the benefits of diversification alone are not sufficient to support the expansion of bank power in the securities and insurance areas.

The Gramm-Leach-Bliley Act

The changes in the Gramm-Leach-Bliley Act may be characterized as facilitating the continued evolution of the financial system rather than permitting revolutionary change. While the barriers separating commercial banking from investment banking and insurance may have at times seemed almost impenetrable, changes in both the markets and the regulators' interpretations of existing law had allowed considerable competition across different subsectors of the financial services industry over the last several decades.

Pre-Gramm-Leach-Bliley Act. The Glass-Steagall Act adopted in 1933 prohibited commercial banks from being affiliated with firms "engaged principally" in investment banking activities such as the issuing, floatation, underwriting, public sale, or distribution of securities.[3] At the same time, the act did not completely prohibit commercial banks from conducting all types of investment banking services. For example, banks could underwrite municipal general obligation bonds and offer certain investment services through their trust departments. Banking organizations could also offer a variety of investment banking products in foreign markets, allowing U.S. banking organizations to develop some experience in investment banking.[4]

Although commercial banks obtained explicit authorization to provide a limited range of securities services, the Glass-Steagall Act effectively kept them out of the mainstream of domestic investment banking. Investment banks had somewhat more success in offering close substitutes for traditional banking products. The rapid growth of the commercial paper market has reduced large firms' use of short-term commercial loans from banks. Investment banks also used money market mutual funds to provide a substitute for demand deposits at commercial banks.

Banks gradually expanded their investment banking activities as the regulatory agencies reinterpreted ambiguous parts of the statutory law.[5] Probably the most significant reinterpretation relates to the Glass-Steagall Act's prohibition on commercial banks' affiliation with firms that "principally engaged" in bank-ineligible activities. Bank lawyers argued that this provision allowed banks to be affiliated with a securities firm as long as the securities firm was not "principally engaged" in ineligible activities.[6] In 1987 the Federal Reserve Board agreed with this interpretation.[7] At first, the securities subsidiaries approved by the Federal Reserve (Section 20 subsidiaries) were subject to strict limits on what they could underwrite and the extent to which they could engage in bank-ineligible activities. These activities were also subject to "firewalls" that limited the potential for the securities affiliate to put the commercial bank at risk but may have limited possible synergies between the two types of affiliates. The various restrictions were relaxed in subsequent years as commercial banks and their regulators gained experience with Section

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1. For example, investment banks offered money market mutual funds as a substitute for bank deposits, and banks offered syndicated loans as a substitute for underwriting bonds.

2. Whether the potential for diversification gains is in fact realized will depend in part on how the combined firms are managed after the takeover. Hypothetical combinations, such as those formed in this article, are inadequate for addressing the question of how the new activities will be managed. The issue of how diversification works in practice is addressed by Wall (1987), Kwan (1998), and Whalen (1999a, 1999b).

3. See Section 9.02 of Fein (1998) for a discussion of the Glass-Steagall Act.

4. See Section 12.01 of Fein (1998) for a discussion of U.S. banking organizations' ability to engage in securities activities outside the United States.

5. See Chapter 9 of Fein (1998) for a discussion of banks' authority to engage in securities activities in the United States. See also Section 1.04 for a review of the key administrative rulings authorizing banks to engage in additional securities activities, and Section 1.05 for the relevant court cases.

6. A securities activity was considered "eligible" if the banks could legally engage in the activity without being restricted by the Glass-Steagall Act.

7. See the Federal Reserve Board's decision on Citicorp/J.P. Morgan & Co., Inc./Bankers Trust New York Corporation in the *Federal Reserve Bulletin* (1987, 473ff).

20 subsidiaries.[8] The relaxation of the restrictions, combined with changes in investment banks' mix of business, allowed the Federal Reserve to approve the acquisition of Citicorp by Travelers Group, a financial firm with a large investment banking operation.[9]

Bank progress in entering the insurance field has been slower. The laws governing banking organizations restricted their ability to provide insurance services. However, regulatory reinterpretations of the statutes by the Office of the Comptroller of the Currency (OCC) in the years leading up to the Gramm-Leach-Bliley Act were opening the door to bank sale of insurance products. A 1916 federal law permits national banks to act as an insurance agent in any community of fewer than 5,000 people. The OCC interpreted this stipulation as requiring the actual insurance activities to be located in communities with a population no greater than 5,000 residents but permitting marketing of the insurance nationally to communities of all sizes.[10]

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Federal bank regulators also used their authority to control bank organizations' entry into other types of financial services. The Federal Reserve limited the activities permissible to bank holding companies under authority provided by the Bank Holding Company Act of 1956 and its amendments. All three federal bank regulators—the Federal Reserve, OCC, and the Federal Deposit Insurance Corporation—placed limits on the activities of subsidiaries of their banks. In the years prior to the Gramm-Leach-Bliley Act, the OCC had undertaken an extensive review of its rules and had determined that subsidiaries of national banks could provide a wide variety of financial services. This interpretation was incorporated into the agency's Part 5 rules.[11] Although national banks might have provided a wide range of heretofore impermissible activities via subsidiaries given sufficient time, relatively few applications for new activities were approved under Part 5 prior to the Gramm-Leach-Bliley Act.

Post-Gramm-Leach-Bliley Act. The Gramm-Leach-Bliley Act ends the need for commercial banks to find loopholes to enter investment banking and insurance and for investment banks and insurance firms to find loopholes to enter commercial banking. Amending the Bank Holding Company

(BHC) Act, the Gramm-Leach-Bliley Act allows commercial banks to be affiliated with a wide range of financial services. As a part of its effort to reduce the barriers between financial services companies, the act repeals the Glass-Steagall prohibitions on the affiliation of commercial and investment banking. At the same time, however, the act added a new barrier separating banking and commerce.

The Gramm-Leach-Bliley Act created a new type of bank holding company, called the financial holding company, under which nonbank activities are organized as subsidiaries of the holding company. If a bank holding company elects to become a financial holding company, all of its subsidiary banks and thrifts must meet several criteria: they must be well capitalized and well managed and must have at least a satisfactory Community Reinvestment Act rating.[12] Financial holding companies are authorized to engage in a variety of activities, including (1) lending, trust, and other banking activities, (2) insurance activities, and (3) securities underwriting and dealing. The Federal Reserve, with the approval of the Secretary of the Treasury, may also expand this list of activities to include other "financial" or "incidental" activities. The criteria for approving additional activities include clear consistency with the purposes of the Gramm-Leach-Bliley Act; actual or likely changes in the financial services marketplace, including innovation in financial and information technology; and assessment of an activity as "necessary or appropriate" to enable financial holding companies to compete or to use technology effectively in providing financial services.

While the Gramm-Leach-Bliley Act seeks to maintain the separation of banking and commerce, the law recognizes that investment banks, merchant banks, and insurance companies may acquire controlling interests in companies in the ordinary course of business. If nonbank providers were prohibited from owning merchant banks, their cost of owning a bank would significantly increase. Thus, the act permits financial holding companies to own a controlling interest in any company. However, to limit the mixing of banking and commerce, a financial holding company must acquire the interest in the ordinary course of business and the financial holding company must act as a passive investor.[13]

The Gramm-Leach-Bliley Act also allows national banks to have a subsidiary that engages in any activity authorized directly for the bank or any financial activity except insurance underwriting, insurance investments, real estate investment or development, and merchant banking.[14] The Secretary of the Treasury may expand the list of permitted activities subject to approval by the Federal Reserve Board.

The act limits the total assets of all financial subsidiaries of a bank to 45 percent of the bank's assets or $50 billion, whichever is smaller.

The Gramm-Leach-Bliley Act closes a loophole in a previous law that allowed holding companies that owned no bank charters and only one thrift charter to be affiliated with commercial activities.[15] The act grandfathers any holding company that owned a thrift charter on May 4, 1999, with the restriction that the owner of the thrift charter may not transfer the charter to another corporation.

Empirical Analysis

The Gramm-Leach-Bliley Act has resolved the public policy problem of what restrictions should be placed on banking organizations' ability to provide nonbank services. However, financial holding companies must still evaluate which services to provide, an evaluation that may depend in part on the diversification gains. Further, supervisors will need to evaluate the safety and soundness implications of the new combinations arising under the financial holding company umbrella.

While several studies provide recent evidence using firm-level data, heretofore none have reexamined industry-level data from the most comprehensive publicly available source, IRS corporate income tax returns. An update of Wall, Reichert, and Mohanty's (1993) analysis of IRS data may be useful given the many differences between data from the 1990s and the 1970s and 1980s, including (1) a different macroeconomic environment with significantly lower inflation and somewhat higher growth in the

1990s, (2) continuing innovation in the financial sector, most notably a continuation of disintermediation, and (3) changes in financial technology and in regulatory limits, allowing financial services firms to provide a wider range of services.[16]

Data. The data are obtained from the IRS Corporate Income Tax Returns for the major sector "Finance, Insurance, and Real Estate" (Major Group 60) for the years 1974–97. This is the same source of the earlier data Wall, Reichert, and Mohanty used (1993). This article follows Wall, Reichert, and Mohanty in focusing on using ROA as the primary measure of profitability. To facilitate comparison, the research reproduces their results for the 1974–80 and 1981–89 periods and provides new results for the 1990–97 period. The ROA analysis is supplemented with an analysis of return on equity (ROE) for the 1990–97 period.

In some years, the corporate returns publication contains two related columns, "Net Income" and "Deficit." Net income refers to total net income for corporations reporting positive earnings for the year. Deficit refers to total losses incurred by corporations reporting losses for the year. In this study, aggregate industry profits for the year were calculated by subtracting the deficit figure from the net income figure to provide a comprehensive picture of industry performance for that year. In some other years a net profit for the total industry is provided by the IRS. A breakdown of the industry categories used by the IRS is provided in the appendix.

Descriptive Statistics. Table 1 presents the results of the ROA analysis by major sector. The first

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8. See Section 9.05 of Fein (1998) for a review of the original firewalls and the subsequent modifications.

9. Travelers Group applied to the Board of Governors of the Federal Reserve System to acquire Citicorp and, thereby, become a bank holding company (which would be renamed Citigroup). The Travelers Group owned Salomon, Smith Barney Inc., one of the largest securities firms in the United States. The Board approved the application on September 23, 1998 (*Federal Reserve Bulletin* 84 [1988], 985-1016). In approving the Travelers application, the Board found that Salomon, Smith Barney's bank-ineligible investment banking activities fell within the 25 percent of revenue test imposed at that time on Section 20 subsidiaries (page 1006 of the Bulletin) and, thus, that the investment banking activities of Travelers were not an obstacle to the transaction. (However, the Board did rely on certain commitments of the new Citigroup to impose certain limits on its securities and investment banking activities.)

10. For an informative discussion of the legislative issues leading up to the Gramm-Leach-Bliley Act, see the interview with Representative James Leach in the March 2000 issue of *The Region* (Vol. 14, No. 1) published by the Federal Reserve Bank of Minneapolis.

11. See the testimony of Eugene A. Ludwig, Comptroller of the Currency, before the Subcommittee on Finance and Hazardous Materials of the Committee on Commerce of the U.S. House of Representatives, July 17, 1997.

12. Section 103 of the Gramm-Leach-Bliley Act lays out the requirements for a bank holding company to become a financial holding company and the range of permissible activities for a financial holding company.

13. Section 103 of the Gramm-Leach-Bliley Act.

14. Section 121 of the Gramm-Leach-Bliley Act establishes the limits on national bank provision of financial services through affiliates.

15. Section 401 of the Gramm-Leach-Bliley Act imposes restrictions on holding companies that own only one thrift charter.

16. Disintermediation is the replacement of financing via loans funded by intermediaries with loans funded by financial markets. Examples of disintermediation include the replacement of commercial loans by banks with commercial paper sold to financial markets and the replacement of mortgage loans held by thrifts with mortgage-backed securities held by a variety of investors.

column indicates the seven broad industry categories used by the IRS to classify the finance sector. The second column indicates, for each industry, the three data periods used in the analysis: (1) the prederegulation period, 1974–80; the initial deregulation period, 1981–89; and the most recent period, 1990–97, which has witnessed continued deregulation and rapid industry consolidation. Congress passed the Depository Institution Deregulation and Monetary Control Act (DIDMCA) in March 1980. DIDMCA is widely regarded as the major piece of legislation that formally ushered in the era of financial deregulation. DIDMCA was shortly followed by the Garn-St. Germain Act of 1982, which accelerated the deregulation process.

The third and fourth columns give the mean industry ROA for each period and the associated industry rank (with larger ROAs ranked higher). The next column indicates the degree of earnings volatility associated with each industry, as measured by the coefficient of variation of ROA over the given time period for industries with positive mean returns. The coefficient of variation of ROA is the ratio of the standard deviation of returns over the period to the mean return over the period.[17] In the next column, volatility is ranked from low to high (thus, industries with low volatility are ranked high). The remaining columns indicate the simple correlation between the ROA of bank holding companies and each industry group. The value of the correlations is ranked from highly positive to highly negative. Thus, industries with high negative correlations are ranked high while industries with high positive correlations are ranked low.

ROA is a broad measure of the efficiency with which resources are employed within an industry and is calculated by dividing annual net income by total year-end assets.[18] As indicated in Table 1, while the banking sector ranked only fifth out of seven in terms of average ROA, it experienced a threefold increase in average earnings during the 1990–97 period compared with the two earlier periods. The only other sector to experience such a dramatic improvement was other credit agencies. While banking historically has recorded a relatively low degree of earnings volatility, the sector was ranked number one as reflected by the lowest coefficient of variation during the decade of the 1990s. From a simple pairwise correlations perspective, the holding and other investment companies sector had the second-lowest

TABLE 1
Industry ROA Volatility and Correlation Analysis, 1974–97

Industry	Period	ROA		Coefficient of Variation of ROA		Correlation with Bank Holding Companies	
		Mean Value	Rank	Value	Rank	Value	Rank
Banking[a]	1974–80	.29	7	25.2	2	.87	6
	1981–89	.24	5	65.3	3	.96	7
	1990–97	.84	5	39.6	1	.99	7
Credit Agencies	1974–80	.35	6	89.2	7	.27	2
(other than banks)	1981–89	−.40	7	163.7	6	.68	6
	1990–97	1.68	3	172.1	6	.32	2
Insurance (broad category)	1974–80	1.48	4	36.6	3	.85	5
	1981–89	.61	3	78.6	5	.66	5
	1990–97	1.10	4	46.9	4	.88	6
Insurance Agents and Brokers	1974–80	7.15	1	21.8	1	.76	4
	1981–89	3.74	2	54.5	2	.63	4
	1990–97	6.03	1	41.3	2	.77	4
Real Estate (broad category)	1974–80	1.61	3	63.3	6	.94	7
	1981–89	.20	6	237.5	6	−.43	3
	1990–97	−.09	7	NM[b]		.46	3
Security, Commodity	1974–80	1.29	5	52.1	5	−.23	1
Brokers and Services	1981–89	.59	4	69.3	4	−.70	2
	1990–97	.83	5	47.8	5	.82	5
Holding and Other	1974–80	4.66	2	37.6	4	.60	3
Investment Companies	1981–89	6.40	1	19.2	1	−.90	1
	1990–97	2.99	2	45.8	3	.34	1

[a] Includes mutual savings banks, bank holding companies, and other (or independent) commercial banks.
[b] Not meaningful.

Source: Wall, Reichert, and Mohanty (1993) and authors' calculation using data from IRS corporate income tax returns

Industry[a]	ROA		Coefficient of Variation of ROA		Correlation with Bank Holding Companies	
	Mean Value	Rank	Value	Rank	Value	Rank
Bank Holding Companies	0.85	13	42.6	2	1.00	23
Mutual Savings Banks	0.96	11	48.0	7	0.09	4
Independent Banks (not mutual savings banks or bank holding companies)	0.59	17	91.0	17	0.05	3
Savings and Loans	0.18	18	156.2	18	−0.24	2
Personal Credit Institutions	0.99	10	59.1	12	0.61	14
Business Credit Institutions	0.60	16	76.1	14	0.66	16
Other Credit Agencies	0.82	14	43.7	4	0.54	12
Life Insurance	0.93	12	48.4	8	0.91	21
Mutual Insurance	1.13	9	87.4	15	0.40	9
Other Insurance	1.44	7	45.9	5	0.80	20
Insurance Agents	6.03	2	41.3	1	0.77	19
Real Estate Operators and Lessors of Buildings	−0.05	20	NM[b]		0.17	5
Lessors of Mining and Oil Properties	8.48	1	43.4	3	0.64	15
Lessors of Railroad Properties	4.55	3	52.8	10	0.52	11
Condominium Management and Coops	−1.16	23	NM		−0.27	1
Subdividers and Developers	−0.68	22	NM		0.30	8
Other Real Estate	0.11	19	1585.8	19	0.52	10
Security Brokers, Dealers	0.70	15	49.4	9	0.76	18
Commodity Brokers, Dealers	3.01	5	55.3	11	0.95	22
Regulated Investment Companies	3.20	4	46.7	6	0.25	6
Real Estate Investment Trusts	2.48	6	62.4	13	0.70	17
Small Business Investment Trusts	−0.41	21	NM		0.29	7
Holding and Other Investment Companies	1.35	8	89.9	16	0.61	13

[a] Detailed statistics for each nonbank industry group are available in Wall, Reichert, and Mohanty (1993).
[b] Not meaningful.

Source: Authors' calculation using data from IRS corporate income tax returns

degree of positive correlation and at the same time was ranked high in terms of average ROA and low earnings volatility during the 1990–97 period.

Table 2 presents similar information for the 1990–97 period for twenty-three industry sub-categories. The most profitable sectors proved to be lessors of mining and oil properties, followed by insurance agencies and lessors of railroad properties. With an average ROA of 0.85, bank holding companies ranked 13. The three least-profitable sectors were condominium and coop management, real estate subdividers and developers, and small business investment trusts.

In terms of earnings volatility, insurance agencies ranked the lowest, followed closely by bank holding

companies and lessors of mining and oil properties. At the other extreme, the three most volatile sectors proved to be "other" real estate, small business investment trusts, and operators and lessors of buildings. Based on pairwise correlations with bank holding company earnings, the three sectors with the smallest correlations are condominium and coop management (−.27), savings and loans (−.24), and independent banks (.05). However, these three sectors ranked in the bottom third in terms of both earnings and volatility.

While ROA is useful for some purposes, ROE provides information that may be of special interest to investors. For example, banking is a low-margin, high-leverage industry. Thus, a bank with an ROA of

17. The coefficient of variation of ROA and of ROE may be thought of as a sort of inverse Sharpe ratio. The Sharpe ratio is a measure of the return to bearing risk and is defined as the ratio of excess returns (mean returns less the risk-free rate) to the standard deviation of returns. The primary difference between the two ratios is that the Sharpe ratio incorporates the return to a riskless asset whereas the coefficient of variation does not.
18. Albeit ROA incorporates only on-balance sheet assets; off-balance-sheet exposures are not incorporated in the ratio.

Evaluation of Prior Studies

The studies of portfolio diversification discussed in Wall, Reichert, and Mohanty (1993) and updated here have approached analyzing the effects on portfolios of diversification into nonbank activities in a variety of ways.[1] The methodologies used each have significant strengths and weaknesses that it is important to understand in evaluating the current state of the literature.

Measurement of Portfolio Performance

Most studies of the effect of portfolio diversification focus on one or two risk measures: the coefficient of variation of some return measure or the risk of failure calculated using accounting or market data. The coefficient of variation is, as noted in the text, merely the variability of returns (standard deviation of returns) divided by the expected return. The risk of failure incorporates a firm's equity capital, its expected returns, and standard deviation of returns to provide a measure of the likelihood that a firm will experience losses that exceed its capital. Risk of failure is a more direct measure of the primary regulatory concern: Would increased participation in nonbank activities make banks more or less likely to fail? However, implicit in the risk-of-failure measure is the assumption that the combined organization's capital structure will be the sum of its individual premerger capital structures, an assumption that may not be appropriate if regulators require higher postmerger capital levels. Further, calculation of the risk of failure requires data on premerger capital structures that may not be available from some data sources.

A further consideration in evaluating portfolio performance is the perspective of bank owners and managers. Most studies focus on risk issues because that is the regulator's concern. Bank owners and managers, however, actually undertake mergers on the basis of the effect of diversification on both the return and risk of the combined organization. Banks may engage in a risk-reducing merger if the reduction in their expected return is not too large, but they may also be willing to undertake higher risk if the increase in expected return is sufficiently large.[2] Thus, a full analysis of the effect of diversification on returns must consider both the banks' and the regulators' perspectives.[3]

Formation of Portfolios

The various studies of bank mergers take three different approaches to forming the portfolios for analysis. Some studies limit their analysis to three or four statistics: industry-average mean returns, industry-average standard deviations of returns, industry-average coefficients of variation of returns on assets, and the correlation of industry returns with banking returns. Looking at industry statistics alone does not allow an easy determination of the change in risk that results from combining different industries into a single firm. For example, an industry might have a higher standard deviation of returns than banking, but the returns may be negatively correlated with banks' returns. Thus, it is not always clear whether the higher standard deviation of a particular firm from this industry combined with a banking firm will increase the risk to the postmerger organization or whether its negative correlation with banking will generate less risk.

An alternative to using overall industry statistics is to combine industries in pairs—banks and one nonbank industry at a time. This approach provides for simultaneously considering the effects of expected return, the standard deviation of returns, and the correlation between returns (as well as the capital positions of the two firms, when appropriate). Perhaps most importantly, this approach has the advantage of corresponding with actual bank behavior. Because firms typically engage in one merger at a time, the concern to banks and their regulators at any given point in time is the desirability of a particular pairwise combination.

The third alternative in examining portfolios is to analyze efficient portfolios of banks and several nonbank industries. As discussed in the article, the term "efficient portfolio" refers to one whose combinations produce the most return for any given level of return variability (or, equivalently, the least return variability for any given return). These portfolios may contain firms operating in only two industries (or in some cases a single industry). However, as Litan (1985) found, some efficient portfolios are likely to contain multiple industries. Examining portfolios of unique service products is advantageous because it is the approach that banks should take from a portfolio risk and return perspective. Thus, basing public policy solely on the risk effects of pairwise mergers may impose significant social costs if it results in policies that prevent the formation of efficient portfolios of bank and nonbank firms.

Timing of Aggregation to Industry Level

The various studies take two approaches to the aggregation of firm data into industry statistics. Some studies combine individual firms into a single industry before conducting any analysis, and others calculate the mean and variability of returns for individual firms (and across pairs of firms) and then aggregate the figures across all firms in the industry (or in the pair of industries). The major disadvantage of the first approach is that individual firms enter into mergers with specific firms, not with broad industries. On the

other hand, industry aggregate figures may be a better proxy for the expected future distribution of returns to the extent that two conditions hold—that is, if within-industry differences primarily arise from regional economic conditions and if firms within industries are combining across regions. Another advantage of using industry aggregates is that spurious results in the formation of portfolios may be less likely.

An efficient portfolio is formed by looking at an individual entity's "assets" to determine the combinations that produce an efficient set of portfolios. These assets may be defined as entire industries or as individual firms within industries. Obviously, the number of separate assets for inclusion in an efficient portfolio will increase dramatically if individual firm returns are used rather than industry returns. In general, an increase in the number of assets is likely to increase the chances of identifying lower-risk portfolios. Thus, Boyd, Graham, and Hewitt (1993) argue that random chance favors the possibility that a risk-reducing portfolio will be found using individual firm data even if there is not a real opportunity for diversification to reduce risk.

Use of Market or Accounting Data

Banks' and nonbank firms' returns may be measured using accounting or financial market data. The drawback to using accounting data is that they are not perfectly correlated with economic returns. Firms often try to smooth accounting data through time, producing reported returns that are deliberately low in the good years and high in the bad years. If firms across different industries have unequal ability to smooth their accounting earnings, then accounting-based risk measures may not provide accurate interindustry comparisons of risk. Using accounting data has some appeal, however. First, market data is typically available only for the largest firms in an industry, so it clearly is more limited than accounting data. In addition, regulators rely heavily on accounting figures in their evaluation of a bank's financial condition.

Studies that rely on accounting data use two sources of information: accounting data from the individual firm's public financial statements prepared according to generally accepted accounting principles (GAAP) and accounting data published by the IRS for all firms in an industry prepared according to IRS accounting rules. Each data set has its advantages. GAAP rules are intended to fairly present a firm's performance over time whereas IRS rules also reflect a number of public policy decisions. For example, to encourage banks to hold state and local government obligations, IRS rules allowed banks to understate their income by excluding the interest from holding these obligations. Another advantage of using GAAP data is that they are available at the individual firm level, and IRS data are available only for an entire industry. On the other hand, IRS data reflect a broad cross-section of firms in an industry while public financial statements are only available for the largest firms.

Overall Evaluation of Prior Studies

As the above discussion suggests, there appears to be no single "correct" methodology. Each has advantages and disadvantages. Ideally, the different approaches would produce consistent results confirming that individual findings were not the result of a unique methodology.

1. This box is adapted from Wall, Reichart, and Mohanty (1993).
2. See Boyd and Graham (1986) for a discussion of the issue of managerial incentives.
3. Boyd, Graham, and Hewitt (1993) point out that an important issue in evaluating the effect of a merger is the purchase price paid for the target by the acquiring organization. Virtually all studies of historical data implicitly assume that no premium will be paid to the target. Researchers use this assumption not because it is realistic but because they have no good basis for determining the likely magnitude of the takeover premium.

only 1.25 percent and a capital-to-asset ratio of 8 percent, would earn a 15.6 percent ROE. On the other hand, a brokerage firm with an ROA of 5 percent and a capital-asset ratio of 50 percent, would earn only a 10 percent ROE. Table 3 replicates Table 2 using ROE over the 1990–97 period.

The use of ROE rather than ROA improved the profitability rankings of depositories (bank holding companies, mutual savings banks, independent banks, and savings and loans), as would be expected from their generally low capital-to-asset ratios. The lower capital ratios also boosted the standard deviation of returns. The net result of the increase in the profitability ratio and the standard deviation for bank holding companies is small; they had the second lowest coefficient of variation using ROA and the lowest coefficient of variation using ROE. The use of ROE rather than ROA caused some changes in the rankings by correlation with bank holding companies, but the differences are generally small.

Efficient Portfolios Using Return on Assets. Table 4 forms efficient portfolios of selected sectors that provide both traditional banking-related services, such as mutual savings banks, savings and loans, and personal and business credit companies and those that provide nontraditional financial services, such as security and commodity brokers and dealers, life insurance underwriters, and security and insurance agents and brokers.[19] The portfolios are formed subject to the assumption that investment in any given industry cannot be less than zero and that there is no risk-free asset.

Efficient portfolio combinations of activities that have traditionally been closely related to banking are presented in the top part of Table 4. The portfolio calculation program calculates the efficient frontier and provides detailed information on portfolios at points selected by the user.[20] In order to provide an overview of the results, portfolios are obtained at various levels of return. Given that the program rounds returns and variances, the point selected to obtain a portfolio for each level of return is the one

with the lowest standard deviation of return. Thus, portfolio B for the 1990–97 period was selected to have an ROA of 0.7 percent. The lowest standard deviation of return for a portfolio with an ROA of 0.7 percent is 0.2 percent. The resulting coefficient of variation is 28.6 percent. A portfolio that yields these returns would invest the following percentages in each industry: 31.0 percent in mutual savings banks, 28.1 percent in bank holding companies, 33.9 percent in savings and loan associations, 4.3 percent in personal credit companies, and 2.7 percent in business credit companies.

Evaluating the results requires a rough standard for judging the extent to which bank holding companies should be allowed to diversify. One reasonable standard suggests that bank holding companies should be allowed to diversify as long as the nonbank activity does not increase the coefficient of variation above that of bank holding companies by themselves. For 1974–80, the mean ROA is 0.27 and the coefficient of variation is 30.6; for 1981–89 the mean ROA is 0.26 and the coefficient of variation is 34.4.

TABLE 3
Banking Industry ROE Volatility and Correlation Analysis, 1990–97

Industry	ROE Mean Value	ROE Rank	Coefficient of Variation of ROE Value	Coefficient of Variation of ROE Rank	Correlation with Bank Holding Companies Value	Correlation with Bank Holding Companies Rank
Bank Holding Companies	8.2	8	38.4	1	1.00	23
Mutual Savings Banks	13.4	5	44.3	4	0.06	4
Independent Banks (not mutual savings banks or bank holding companies)	8.1	9	99.7	17	0.06	5
Savings and Loans	7.5	11	184.5	18	–0.39	1
Personal Credit Institutions	5.6	13	47.1	6	0.85	21
Business Credit Institutions	8.1	10	52.0	10	0.64	17
Other Credit Agencies	10.5	7	42.5	2	0.63	16
Life Insurance	7.3	12	47.8	7	0.83	20
Mutual Insurance	4.2	16	85.2	16	0.40	11
Other Insurance	4.5	14	43.6	3	0.65	18
Insurance Agents	16.4	3	61.8	13	0.48	14
Real Estate Operators and Lessors of Buildings	–0.4	19	NM[a]	NM	0.06	3
Lessors of Mining and Oil Properties	19.1	1	62.8	14	0.25	7
Lessors of Railroad Properties	10.6	6	53.7	12	0.46	13
Condominium Management and Coops	–2.3	22	NM	NM	–0.31	2
Subdividers and Developers	–4.5	23	NM	NM	0.30	9
Other Real Estate	–0.9	20	NM	NM	0.34	10
Security Brokers, Dealers	15.9	4	51.0	9	0.79	19
Commodity Brokers, Dealers	18.1	2	52.6	11	0.91	22
Regulated Investment Companies	3.3	17	46.7	5	0.25	8
Real Estate Investment Trusts	4.4	15	47.8	8	0.52	15
Small Business Investment Trusts	–1.2	21	NM	NM	0.16	6
Holding and Other Investment Companies	3.3	18	81.0	15	0.41	12

[a] Not meaningful.

Source: Authors' calculation using data from IRS corporate income tax returns

Traditional Banking Activities. Looking at traditional banking activities in Table 4 and applying the above standard to the 1974–80 period, portfolio D, a financial services holding company comprising mutual savings banks (37.5 percent), personal credit (15.5 percent) and business credit (47 percent) institutions, and less than 1 percent savings and loans and bank holding companies would have generated an ROA approximately three times as large as reported by bank holding companies alone, with roughly the same level of risk (coefficient of variation of 25.0 percent vs. 30.6 percent). During the middle period (1981–89), financial institutions with approximately the same degree of risk as bank holding companies, portfolio A, would have allocated more than 93 percent of their assets to mutual savings banks, with the remaining assets invested in personal credit institutions.

In contrast to the earlier periods, bank holding companies are included in all of the portfolios over the 1990–97 period in proportions that range from approximately 10 percent to 33 percent. All of the portfolios have a coefficient of variation less than bank holding companies by themselves. Mutual savings banks remain a substantial part of all portfolios and dominate the highest-return portfolio. Savings and loan companies also enter the lower-return efficient portfolios and provide more than one-half of the assets in the lowest-risk portfolio. Personal credit and business credit institutions also enter all but the highest-return portfolio, but these activities generally receive less weight than in prior periods. The variance of returns and the coefficient of variation of returns in the last period are greater than those during the 1974–80 period but less than those of the 1981–89 period.

Nontraditional Banking Activities. In terms of nontraditional activities, Table 4 presents a much wider range of possible ROAs, reflecting the greater earnings opportunities available outside traditional banking services. For the two earlier periods, bank holding companies play a significant role but only for portfolios A and B, which yield relatively low ROAs (1.0–1.5 percent). Table 4 indicates that, even at low levels of return, during the 1970s a dramatic increase in ROA could be achieved by diversifying into a variety of nontraditional activities while at the same time reducing risk by approximately 50–60 percent. For

example, in portfolio B a financial services company that invests only 14 percent of its assets in bank holding companies and the majority of its assets (70 percent) in life insurance would generate a coefficient of variation of only 6.7 percent and an expected ROA of 1.5 percent, compared with a pure bank holding company that reported a coefficient of variation of 30.6 percent and an average ROA of 0.27 percent during the same period. Of the remaining financial sectors, either life insurance underwriting or insurance agents and brokers dominate the portfolio for higher expected returns. For the 1980s, an optimal portfolio mix suggests that bank holding company involvement disappears entirely beyond an expected ROA of 2.5 percent and a coefficient of variation of 7.2 percent. These figures compare quite favorably to an ROA of only 0.26 percent and a coefficient of variation of 34.4 percent for bank holding companies alone during this period.

During the 1990s the picture changes quite dramatically, with bank holding companies contributing meaningfully in virtually all portfolios with an ROA of 4.5 percent or less (portfolios A–G). The remainder of the efficient portfolios including nontraditional activities consists largely of insurance agents and regulated investment companies. The only exception is the lowest-return portfolio, in which security brokers are approximately one-fifth of the portfolio. Commodity brokers, life insurance underwriters, and subdividers and developers do not enter the efficient portfolio (no greater than 0.1 percent) except for a small share (1.4 percent) devoted to subdividers and developers in portfolio I. The standard deviation of ROA and the coefficient of variation of ROA are higher during the last period than either of the preceding two periods. However, the coefficient of variation of ROA is not

> As financial holding companies become more diversified, it will become more difficult to measure the benefits of diversification by simply forming efficient portfolios. Diversification will take place as much within as between industry classifications.

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19. The mathematics of linear algebra limits the number of industries to no more than the number of years in a sample. If the optimization program is given more industries than years then one or more industries will become linear combinations of the other industries and the solution to each of the efficient portfolios will not be unique. The table illustrates the optimal combination of each industry for selected ROAs.

20. The program used to form the portfolios is The Investment Portfolio, version 1.0, designed by Edwin J. Elton, Martin J. Gruber, and Christopher R. Blake. The program sometimes had problems forming efficient portfolios when the portfolio share of an industry was allowed to vary between 0 percent and 100 percent. However, in these cases it was able to estimate the efficient portfolio when each asset was constrained to consist of no more than 99.99 percent of the portfolio.

TABLE 4
Efficient Portfolios of Both Traditional and Nontraditional Financial Services, ROA (Percent)[a]

Traditional Activities				
1974–80	A	B	C	D
Efficient Risk and Return Combination				
Mean ROA	0.5	0.7	0.9	1.0
Standard Deviation ROA	0.1	0.2	0.2	.2
Coefficient of Variation	26.0	24.3	24.4	25.0
Associated Portfolio Allocations				
Mutual Savings Banks	80.2	63.1	46.0	37.5
Bank Holding Companies	0.0	0.0	0.0	0.5
Savings and Loan Associations	0.0	0.0	0.0	0.5
Personal Credit Institutions	5.5	9.5	13.5	15.5
Business Credit	14.3	27.4	40.5	47.0
1981–89	A	B	C	D
Efficient Risk and Return Combination				
Mean ROA	0.3	0.4	0.6	0.8
Standard Deviation ROA	0.1	0.3	0.5	0.8
Coefficient of Variation	40.0	62.5	90.0	103.8
Associated Portfolio Allocations				
Mutual Savings Banks	93.1	75.9	41.4	6.9
Bank Holding Companies	0.0	0.0	0.0	0.0
Savings and Loan	0.0	0.0	0.0	0.0
Personal Credit	6.9	24.1	58.6	93.1
Business Credit	0.0	0.0	0.0	0.0
1990–97	A	B	C	D
Efficient Risk and Return Combination				
Mean ROA	0.5	0.7	0.9	1.0
Standard Deviation ROA	0.1	0.2	0.3	0.4
Coefficient of Variation	20.0	28.6	33.3	40.0
Associated Portfolio Allocations				
Mutual Savings Banks	25.2	31.0	39.9	86.0
Bank Holding Companies	10.0	28.1	33.4	14.0
Savings and Loan	52.4	33.9	6.6	0.0
Personal Credit	0.0	4.3	20.1	0.0
Business Credit	12.4	2.7	0.0	0.0

substantially greater and is generally slightly less for each of the portfolios of nontraditional activities than for bank holding companies by themselves.

The benefits for diversification into nontraditional financial activities during the two earlier periods were two-dimensional in that the bank holding company could achieve a significant increase in expected earnings while achieving a substantial reduction in risk. On the other hand, the benefits for diversification during the past decade had little to do with risk reduction but appear to have been related almost entirely to a substantial increase in expected earnings.

Efficient Portfolios Using Return on Equity. The ratio of equity capital to assets varies across different types of financial services providers.[21] Thus, the efficient portfolio allocations using ROE as the measure of profitability may be different from those using ROA. Further, the allocations based on ROE may provide more insight to managers of financial firms, given that theory suggests that firms should

focus on maximizing shareholder wealth rather than return on assets. Thus, Table 5 provides efficient portfolio allocations using ROE for the 1990–97 period.

The allocations for traditional activities using ROE in Table 5 appear roughly the same as the allocations using ROA in Table 4. The allocations are not exactly comparable because a 10 percent allocation in Table 4 indicates that 10 percent of assets should be invested in the industry whereas the same percentage allocation in Table 5 indicates that 10 percent of equity should be invested in the industry. Bank holding companies constitute a large fraction of the optimal portfolios with intermediate levels of ROE but are not included in either the very low or very high return portfolios. In contrast, mutual savings banks and savings and loans are in all of the efficient portfolios, with mutual savings banks dominating the high-return portfolios. All of the portfolios of traditional activities had a lower coefficient of variation of ROE than bank holding companies have by themselves, a

TABLE 4 (Continued)

Nontraditional Activities

1974–80	A	B	C	D	E	F	G	H	I
Efficient Risk and Return Combination									
Mean ROA	1.0	1.5	2.5	3.0	3.5	4.0	4.5	5.0	6.0
Standard Deviation ROA	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.1
Coefficient of Variation	10.0	6.7	10.0	12.0	13.7	14.8	15.8	16.6	17.8
Associated Portfolio Allocations									
Bank Holding Companies	46.2	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Security Brokers	6.8	9.7	7.2	6.1	5.0	3.9	2.8	1.7	0.0
Commodity Brokers, Dealers	2.9	3.4	6.5	8.4	10.4	12.3	14.2	16.2	18.1
Life Insurance Underwriters	43.2	70.4	68.0	58.1	48.1	38.3	28.4	18.6	0.0
Insurance Agents, Brokers	0.0	0.0	9.9	17.1	24.3	31.5	38.7	45.9	60.7
Regulated Investment Companies	0.0	2.9	8.4	10.2	12.1	13.9	15.7	17.6	21.2
Subdividers and Developers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981–89	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Efficient Risk and Return Combination									
Mean ROA	1.0	1.5	2.5	3.0	3.5	4.0	4.5	5.0	6.0
Standard Deviation ROA	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.9
Coefficient of Variation	5.0	6.0	7.2	7.0	8.9	10.0	11.1	12.2	14.7
Associated Portfolio Allocations									
Bank Holding Companies	76.6	54.3	9.5	0.0	0.0	0.0	0.0	0.0	0.0
Security Brokers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Commodity Brokers, Dealers	1.0	1.7	3.1	6.7	12.4	18.7	23.9	26.0	6.2
Life Insurance Underwriters	6.4	13.6	28.1	26.6	18.6	10.6	2.7	0.0	0.0
Insurance Agents, Brokers	1.3	3.5	7.8	11.2	15.6	19.9	24.3	28.5	32.6
Regulated Investment Companies	9.3	15.1	26.6	31.0	34.5	38.2	41.6	45.5	61.2
Subdividers and Developers	5.3	11.8	24.9	24.4	18.8	13.2	7.6	0.0	0.0
1990–97	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Efficient Risk and Return Combination									
Mean ROA	1.0	1.5	2.5	3.0	3.5	4.0	4.5	5.0	6.0
Standard Deviation ROA	0.4	0.5	0.9	1.1	1.1	1.5	1.7	1.9	2.3
Coefficient of Variation	40.0	33.3	36.0	36.7	31.4	37.5	37.8	38.0	38.3
Associated Portfolio Allocations									
Bank Holding Companies	69.4	76.1	55.4	45.0	34.4	24.3	13.8	2.9	0.0
Security Brokers	22.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Commodity Brokers, Dealers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life Insurance Underwriters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Insurance Agents, Brokers	0.0	1.8	19.7	28.8	38.0	46.6	55.8	65.2	98.6
Regulated Investment Companies	7.9	22.1	24.9	26.3	27.7	29.0	30.5	31.9	0.0
Subdividers and Developers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4

[a] The results are rounded to one decimal place. As a result, the portfolio allocations sometimes sum to slightly more or less than 1.0. Further, the rounding was applied independently to the mean, standard deviation, and coefficient of variation for ROA for the results obtained from Wall, Reichert, and Mohanty (1993). Thus, the coefficient of variation for 1974–80 and 1981–89 is not necessarily equal to the reported standard deviation divided by the mean.

Source: Wall, Reichert, and Mohanty (1993) and authors' calculation using data from IRS corporate income tax returns

result that mirrors the finding for the coefficient of variation of ROA for traditional activities.

The results forming portfolios using ROE for the nontraditional activities, also seen in Table 5, can be usefully compared with the portfolios formed using ROA. There are several similarities: bank holding companies enter into all of the portfolios except the highest-risk portfolio, insurance agents enter the higher-return portfolios, and regulated investment companies are in the lowest-risk portfolios. Another similarity is that life insurance does not enter any of the portfolios for the 1990–97 period. There are also several differences: security brokers enter the high-return portfolios using ROE rather than the low-return portfolios using ROA, and commodity brokers and dealers dominate the highest-return portfolios

21. Some finance theories hold that the ratio of equity to assets should vary across industries depending upon factors such as the volatility of the industry's earnings and the costs incurred by the firm if it becomes financially distressed.

Traditional Activities

	A	B	C	D	E	F
Efficient Risk and Return Combination						
Mean ROE	8.0	9.0	10.0	11.0	12.0	13.0
Standard Deviation ROE	1.7	1.8	1.8	2.4	3.3	4.6
Coefficient of Variation	21.3	20.0	18.0	21.8	27.5	35.4
Associated Portfolio Allocations						
Mutual Savings Banks	28.9	29.3	35.6	54.9	74.3	91.9
Bank Holding Companies	0.0	34.0	49.5	28.3	0.0	0.0
Savings and Loan Companies	8.2	12.0	14.9	16.3	16.8	8.1
Personal Credit Companies	62.8	24.7	0.0	0.0	0.0	0.0
Business Credit Companies	0.0	0.0	0.0	0.5	8.9	0.0

Nontraditional Activities

	A	B	C	D	E	F	G	H	I
Efficient Risk and Return Combination									
Mean ROE	3.0	5.0	7.0	9.0	11.0	13.0	15.0	17.0	18.0
Standard Deviation ROE	1.2	1.5	2.3	3.2	4.2	5.3	6.4	7.6	8.5
Coefficient of Variation	40.0	30.0	32.9	35.5	38.2	40.7	42.7	44.7	47.2
Associated Portfolio Allocations									
Bank Holding Companies	7.6	33.8	65.7	88.6	67.7	45.9	24.6	2.6	0.0
Security Brokers	0.0	0.0	0.0	0.0	6.4	10.3	14.1	18.0	0.0
Commodity Brokers/Dealers	0.0	0.0	0.0	0.0	10.6	24.2	37.5	51.3	89.8
Life Insurance Underwriters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Insurance Agents, Brokers	0.0	0.0	3.4	10.2	15.3	19.6	23.8	28.2	10.1
Regulated Investment Companies	83.9	66.2	31.0	1.2	0.0	0.0	0.0	0.0	0.0
Subdividers and Developers	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] The results are rounded to one decimal place. As a result, the portfolio allocations sometimes sum to slightly more or less than 1.0.

Source: Authors' calculation using data from IRS corporate income tax returns

using ROE whereas the industry never enters the efficient portfolio using ROA. Another difference is that several of the portfolios formed using ROE have lower coefficients of variation than bank holding companies by themselves. Nevertheless, portfolios with ROEs as high as 11 percent may be formed from nontraditional activities, which have a lower coefficient of variation of ROE than bank holding companies by themselves.

Implications of the Empirical Results. Consistent with Wall, Reichert, and Mohanty's (1993) findings, the above results suggest that the optimal portfolio is time-varying.[22] One new finding is that bank holding companies are a more important element of the efficient portfolio for both traditional and nontraditional activities in the 1990s than they were in the 1970s and the 1980s. Although the empirical analysis is not designed to explain why banks were more important in the 1990s, two plausible hypotheses are that banks have benefited more from the stable macroeconomic environment in the 1990s and that banks may have benefited from relaxed restrictions on their ability to expand geographically and into new product areas.

One limitation of the results is that they may imply portfolio combinations that are not feasible, at least for large financial holding companies. For example, the analysis of efficient portfolios suggests that the highest-return portfolio using ROE invests 90 percent of its equity in commodity brokers and dealers while the highest-return portfolio using ROA over the 1990–97 period invests almost 99 percent of its assets in insurance agents and brokers. While commodity brokers and dealers and insurance agents were especially profitable parts of the financial services industry, they were, in terms of assets, a relatively small portion.

Conclusion

The Gramm-Leach-Bliley Act sweeps away most of the barriers limiting the affiliation of banks with nonbank financial services providers. The focus now shifts to financial services executives who must decide which combinations provide the best opportunities to increase shareholder wealth. Existing empirical evidence suggests that an important consideration in this decision is the potential gain from portfolio diversification into new activities. The available empirical evidence also

suggests that the potential for such gain clearly exists. However, the results provided by this article emphasize that the efficient combination may change over time, perhaps for reasons such as the macroeconomic environment or technology. One positive result from the analysis for bankers is that in recent years banks have become a larger part of the efficient financial services portfolio than they were in the 1970s or the 1980s.

As financial holding companies become more diversified, it will become more difficult to measure the benefits of diversification by simply forming efficient portfolios. Aggregate measures of industry profitability, such as those provided by the IRS, will mask any synergies already present in the performance data. That is, diversification will take place as much within as between industry classifications. On the other hand, the IRS and other data sources may define a new category to capture the performance of diversified financial holding companies.

Another trend that is currently unfolding is the trend toward using the Internet for the production and delivery of financial services. In a review of the Gramm-Leach-Bliley Act, Barth, Brumbaugh, and Wilcox (2000) discuss the future of banking and how passage of the act may allow banks to recapture some of their lost market share. They raise the issue as to whether the "portfolio model" as evidenced by Citigroup, which combines in a single institution a wide range of banking, insurance, and investment services, will be competitive in a world of "financial portals" like Yahoo Finance. In a recent study Morgan Stanley Dean Witter (1999) discusses how financial services will possibly evolve on the Internet over the next several years. They project that financial services on the Internet will grow at an annual compound rate of growth of 34 percent from 1999 to 2003. Annual revenue from a wide range of financial services such as banking, brokerage services, auto insurance, and term life insurance, as well as credit card fees, is expected to grow from approximately

$100 billion in 1999 to $435 billion by 2003. In terms of broad trends, Morgan Stanley Dean Witter forecasts increased competitive pressures as technological and regulatory impediments fall and as product unbundling and price transparency put a squeeze on profit margins. Their evaluation of various financial models predicts that "vertical portals" will become the ultimate distributor of financial services.

Morgan Stanley Dean Witter (1999) defines a financial services vertical portal as a web site devoted to financial services where cyber customers can buy or get information on a wide variety of financial products. Its competitive strength relates to its breadth of product offerings, user friendliness, twenty-four-hour, seven-days-a-week availability, and the ability to customize. At a minimum, a financial vertical portal should allow the user to get current financial information; obtain brokerage services; review account balances; see and pay bills; plan for retirement; purchase life, auto, and home insurance; and obtain a mortgage or a credit card.

In practice, financial firms appear to be trying a variety of strategies. Some firms with large investments in brick and mortar are creating or participating in portals (for example, see Power 2000). In contrast, one provider of financial services over the Internet, E*Trade, has acquired a commercial bank, formerly called Telebank, to provide a wider variety of services.

Thus, the Internet may reduce the potential synergistic gains from financial companies owning the providers of a variety of financial services. If so, the impact of the Internet will be to reinforce Berger's (2000) finding that the largest potential benefits of conglomeration lie in reduced financial risk due to portfolio diversification. The findings presented in this article suggest that such portfolio diversification may allow financial firms to earn higher rates of return at little or no increase in risk. However, the results also suggest that the efficient combination of services from a portfolio diversification perspective varies through time.

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22. That the optimal portfolios vary through time does not suggest that the government should restrict possible combinations. Firms will restructure (selling some activities and buying others) if the gains from restructuring the firm's activities are sufficiently large.

IRS Industry Categories

The IRS corporate returns publication breaks the general finance, insurance, and real estate sector down into twenty-three minor industry groups as follows (a brief description for some of the less obvious industries is included).

Banking
- Mutual savings banks
- Bank holding companies, including both one bank and multibank holding companies
- Independent banks, excluding mutual savings banks and bank holding companies

Credit Agencies
- Savings and loan associations
- Personal credit institutions, which are establishments primarily engaged in providing loans to individuals and establishments engaged in financing retail sales made on the installment plan and automobile financing
- Business credit institutions, which are establishments engaged in making loans to business and agricultural enterprises, such as short-term business credit institutions (commercial finance companies), accounts receivable and commercial paper factoring, direct financing of working capital, captive automobile finance companies (for example, GMAC), mercantile financing, and so forth.

Insurance
- Life insurance companies
- Mutual insurance companies (except life or marine and certain fire or flood insurance companies)

Insurance Agents and Brokers
- Agents and brokers dealing in insurance
- Organizations offering services to insurance companies and policyholders, such as insurance claim adjusters

Real Estate
- Real estate operators and lessors of buildings, including firms that operate and lease but do not develop real property, such as operators of commercial and office buildings, retail establishments and shopping centers, and so forth
- Lessors of mining, oil, and similar properties
- Lessors of railroad property, including firms such as airport leasing offices, landholding offices, and others
- Condominium management and cooperative housing associations
- Subdividers and developers, including firms engaged in subdividing real property into lots and in developing them for resale on their own account

Security, Commodity Brokers and Services
- Security brokers, dealers, and flotation companies, including establishments engaged in the purchase, sale, and brokerage of securities and those, generally known as investment bankers, that originate, underwrite, and distribute securities issues
- Commodity contract brokers and dealers; security and commodity exchanges; and allied services, firms that buy and sell commodity contracts on either the spot or future basis for their own account or the account of others and that provide investment advice regarding securities to companies and individuals on a contractual or fee basis, and so forth

Holding and Other Investment Companies[1]
- Regulated investment trusts, including a wide range of firms such as open and closed-end investment funds, money market mutual funds, unit investment trusts, and so forth
- Real estate investment trusts (REITs), including firms engaged in closed-end real estate investments or related mortgage assets that meet the requirements of the amended Real Estate Investment Act of 1960, such as mortgage investment trusts, mortgage and realty trusts, and real estate investment trusts
- Small business investment trusts (SBITs)

1. Excludes bank holding companies.

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