

## **LIMITATIONS ON THE BUSINESS OF BANKING**

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### **Abstract**

Using a simulation model, the study examines the impact to states and national BHCs if allowed greater participation in securities (segmented into securities brokerage and investment banking), insurance (brokerage, life insurance underwriting, and property-casualty underwriting), or real estate (segmented into five industries ranging from brokerage to development). Utilizing accounting earnings and market return data from 1971 to 1989, this paper determines the upper-bound of diversification benefits if greater participation were allowed. This study complements previous studies which, by their random-merger design, determine the lower-bound of diversification benefits. The results support controlled expansion into insurance and securities activities. Regarding insurance and securities, the evidence indicates more caution for expansion into greater securities than insurance activities because of investment-level sensitivity. The results do not support increased real estate powers.

### **INTRODUCTION**

The United States financial services industry is approaching the concept of the financial supermarket, where all types of financial services are available from one vendor. The major obstacle of this evolution is the separation of banking from other financial services. Banks and bank regulators are attempting to expand the activities in which banks may engage. The three major areas for bank expansion are insurance, investment banking, and real estate.<sup>1</sup> The arguments for greater nonbanking powers by banks generally fall into one of three categories: 1) Diversification will reduce the risk of the bank holding company (BHC); 2) There is a need to level the playing field between banks and other financial service firms; 3) Economies of scale and scope will increase bank profitability and reduce risk.

This paper focuses on the potential of portfolio diversification benefits if BHCs obtain broader nonbanking powers. The argument concerning the potential diversification benefits between banks and nonbanking firms (NBFs) is much like the basic argument for stock portfolio diversification--increasing the business diversification of BHCs reduce their risk.

The question of the existence and extent of diversification between banking and nonbanking firms is examined in several previous studies. If the data were available, the best way to study this issue would be to compare banks with and without nonbanking powers. The data to conduct such a study is insufficient for U.S. banks. Simulation models are then the best available solution to address the question. Previous work using this approach has provided insight into the diversification question.

### **THE LITERATURE**

Boyd and Graham [1] (BG) simulate hypothetical mergers. Using data from the COMPUSTAT tapes, BG randomly merge a BHC with a NBF. The consolidated firm is simply the sum of the two firms. The proportion of each firm in the consolidated portfolio is predetermined by the size of each firm. Risk is measured by the familiar variance of returns (defined as net income after taxes divided by average accounting equity) in a two-security portfolio. BG find that only in the case of life insurance does there appear to be a reduction in the risk (defined as

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standard deviation of equity) of the combined portfolio. While the BHC and life insurance combination is safer, the returns for such a combination are lower.<sup>2</sup> Benston [2] alleges that six of the eleven firms in the “securities” classification are misclassified. These six firms have activities that are not pure securities activities. Even though this criticism has some merit, it ignores data problems inherent in empirical research. A finer industry classification measure could overcome this critique.

Brewer, Fortier, and Pavel [5] (BF&P) use both accounting and market data to examine the potential changes in BHC risk. They examine the correlations of BHCs and NBFs for potential benefits in diversification. Using the correlations from representative firms between the various industries, BF&P find the safest bank is 87.6 percent banking, 7.5 percent insurance agents/brokers, and 4.9 percent life insurance. This business composition results in a reduction of both risk and average return of about three percent.

Brewer [4] uses BHC equity returns to test the relationship between market-based risk measures and accounting-based financial information. His model follows the Black and Scholes option model to relate the volatility of the return on equity to the volatility of the return of BHC assets. Note that this study examines the permissible nonbank activities and BHC risk. Examining 155 BHCs over the year 1986, Brewer finds BHC risk is negatively associated with asset size, participation of standby letters of credit, and the mix of investments in permissible nonbank subsidiaries. Earlier, Brewer [3] determines that the level of investment by BHCs in allowable nonbanking powers is inversely related to BHC risk. These two studies indicate a risk reduction as BHCs expand their allowable business activities.

A series of relevant articles appear in a recent special issue of the *Journal of Banking and Finance* on “Universal Banking and the Separation of Banking and Commerce.” Saunders [6] provides an overview of the issues concerning the separation of banking and commerce and reviews the relevant literature. He concludes that given the general lack of empirical evidence, no one has been able to make a convincing case (at least to the regulators) to relax the regulations separating commerce and banking. Shull [7] traces the United States’ regulations separating commerce and banking. As with any highly regulated industry, Shull notes a regulatory dialectic. A striking feature of the United States’ experience is the persistence of separation in an economic system that rewards business expansion into new activities to meet market demands. Steinherr and Huveneers [8] study banks across countries to determine if universal banks have an advantage. They conclude that universal banks do have a risk-return trade-off advantage. Translating their results to the United States is not seamless as universal banks are harmed when the economic environment is deregulated and the financial markets are more developed.

Previous simulation studies assume by definition that the BHC makes no attempt to reduce risk. Because previous simulation studies either randomly merge or use representative firms in a monte carlo style simulation, those models cannot capture the risk-reducing behavior of BHC managers (or regulators). This is an important omission since causal observation as well as the studies by Brewer [3,4] indicate that the currently more diversified BHC is a safer BHC. The simulation studies are, in effect, establishing a lower bound of risk-reduction potential. This study is designed to establish the other, upper bound of risk-reducing potential. This study, by capturing diversification potential, bridges the gap left by previous hypothetical merger studies (which provide only marginal evidence in favor of power expansion) and empirical measures of current BHC risk (which find business activity diversification reduces risk).

This study also systematically exhausts the available data rather than either randomly hypothetically merging firms or forming representative firms. This study uses a finer classification of the industries than previous work. Furthermore, this study uses data that includes the late 1980s, noted as years of poor bank performance.

## METHODOLOGY

The first measure of interest is the profitability of the firms. NBFs and BHCs are grouped by Standard Industry Codes (SICs). The first measure of profitability is the rate of return on average accounting equity,  $\tilde{A}$ , defined as:

Equation 1

$$\tilde{A}_j = \frac{2\tilde{\pi}_j}{E_j + E_{j-1}}$$

where  $\pi$  is net income after taxes,  $E$  is total equity, and the subscript  $j$  denotes the time period. The measure of risk for the individual firm is the variance of returns. The variance is determined by:

Equation 2

$$\sigma_A^2 = \sum_{j=1}^n \frac{(\tilde{A} - \bar{A})^2}{(n-1)}$$

where  $A$  is defined in equation (1).

BHCs and NBFs are hypothetically combined into portfolios. The question of interest is if the portfolio is less risky than the BHC alone. The measure of risk (denoted as  $\sigma_C^2$ ) is the variance of returns in the two-security portfolio, measured by:

Equation 3

$$\sigma_C^2 = p^2 \sigma_{NBF}^2 + (1-p)^2 \sigma_{BHC}^2 + 2p(1-p) \rho_{NBF,BHC} \sigma_{NBF} \sigma_{BHC}$$

where  $p$  is the proportion of the NBF in the combined portfolio, and  $\rho_{NBF,BHC}$  is the correlation coefficient between NBF and BHC earnings.

The study is further extended to include annual holding period returns. The holding period or market return is defined as:

Equation 4

$$R_j = \frac{(P_j - P_{j-1} + D_j)}{P_{j-1}}$$

where  $R$  is the holding period return,  $P$  is the price per share,  $D$  is dividends during the period, and  $j$  represents the period. All prices are adjusted for stock dividends and splits.

The methodology in conducting the simulation is the same whether accounting or market data are used. The results in all cases then represent the upper bound of diversification benefits. Note that it is possible to increase the variance of the combined portfolio even if the correlation between the firms is not equal to one. This occurs whenever the ratio of standard deviation of the returns is greater than the correlation of returns; that is, the risk reduction due to the offsetting of patterns of returns is less than the additional variance introduced by the new activity.

The critical assumption needed to capture the upper bound of risk reduction is that bank managers have but one objective: to reduce the risk of the overall BHC. It is also assumed that the bank manager has "omniscience" concerning all firms involved over the test period. Omniscience is defined as the bank manager knowing the patterns of returns for both the BHC and the NBF. Each individual BHC is examined to find if any or all NBFs, when merged with the BHC, reduce the variance of the combined portfolio. In addition to looking for any NBF to reduce risk, the proportion invested is allowed to range from .01 to .99. The data of interest is the proportion range that reduces risk. Clearly, a  $p$  value of .00 indicates that no risk reduction occurs. The assumptions of the simulation are:

1. BHC managers have but one goal, to reduce the risk as measured by the variance of the combined portfolio;
2. Over the period, managers are omniscient;
3. No agency costs occur as a result of the expansion of bank powers;
4. No merger premiums or costs exist;
5. The capital structure does not change due to the merger.

Clearly, if for any NBF industry no risk reduction takes place given omniscience, then expansion into that industry is not supported, as no bank manager could perform better than an omniscient manager, and this simulation defines the upper bound of risk-reducing potential.

The problem is actually more complex because of deposit insurance.<sup>3</sup> Deposit insurance disrupts the normal risk and return trade-off found in pure portfolio theory. To capture this complication, BHC managers are further assumed to only diversify if they believe the potential merger to be a “Beneficial Merger.” A Beneficial Merger is

**TABLE 1**  
**SICs, Abbreviations, Descriptions, And Definitions**

<b>Abbreviation</b>	<b>Description</b>
Nat BHCs	SIC 6021–National Commercial Bank Holding Companies. (113 firms)
State BHCs	SIC 6022–State Commercial Bank Holding Companies. (59 firms)
Sec-B/D/Ft	SIC 6211–Establishments primarily engaged in the purchase, sale, and brokerage of securities; and those generally known as investment bankers, primarily engaged in originating, underwriting and distributing issues of securities. (26 firms)
Sec-Inv Adv	SIC 6282–Establishments primarily engaged in furnishing investment information and advice to companies and individuals concerning securities and commodities on a contract or fee basis. Establishments that provide advice and also act as brokers or dealers are classified in Industry 6211. (9 firms)
Ins-Life	SIC 6311–Establishments engaged in the underwriting of life insurance. (38 firms)
Ins-F/M/C	SIC 6331–Establishments primarily engaged in underwriting fire, marine, and casualty insurance. (17 firms)
Ins-Agt/Br	SIC 6411–Agents representing one or more insurance carriers, or brokers not representing any particular carrier primarily engaged as independent contractors in the sale or placement of insurance contracts with carriers, but not employees of the insurance carriers they represent. This industry also includes independent organizations concerned with insurance services. (18 firms)
RE-Other	SIC 6500–Other real estate operators not listed under any other industry group number. (17 firms)
RE-Nonres	SIC 6512–Establishments primarily engaged in the operation of nonresidential buildings. (34 firms)
RE-Lessor	SIC 6519–Lessors of Real Property, not elsewhere classified under industry group number 651 (the other classifications in group number 651 are lessors of railroad property and operators of residential mobile home sites). (15 firms)
RE-Agt/Man	SIC 6531–Establishments primarily engaged in renting, buying, selling, managing, and appraising real estate for others. (15 firms)
RE-Devlpr	SIC 6552–Establishments primarily engaged in subdividing real property into lots, except cemetery lots, and in developing it for resale on their own account. (80 firms)
Beneficial Merger	A merger that either increases earnings at the same or lower risk of the BHC before the merger; or decreases risk at the same or higher earnings of the BHC before the merger.
Percentage	Percentage of firms resulting in Beneficial Mergers.
Proportion	Given a Beneficial Merger, the maximum investment in the nonbanking activity.

defined as a merger that either increases earnings at the same or lower risk of the BHC before the merger; or decreases risk at the same or higher earnings of the BHC before the merger. Given the structure of deposit insurance, BHC managers have no incentive to accept a merger resulting in lower risk and lower profits, and, as such, this scenario is not examined. Of course, the Beneficial Merger case includes all of the previous assumptions. Given a Beneficial Merger exists, the maximum proportion of the NBF in the hypothetical portfolio is measured.

The data for the simulation are found on the annual COMPUSTAT Research files for the years 1971 - 1989. The data are screened twice: first, there must be at least 10 years of data for the firm to be included in an industry group; and second, each industry group must have 10 firms to be analyzed in the simulation. For those firms that do not have complete information, only the matching years are examined and there must be at least ten years of matched data to be included in the simulation. Table 1 displays the formal definitions used in the study and descriptive information of the data after screening. Table 2 provides sample firm median and standard deviation of earnings and returns.

**TABLE 2**  
**Sample Firm Median And Standard Deviation Of Earnings And Returns**

SIC	Industry	Earnings	Earnings Std. Dev.	Returns	Returns Std. Dev.
6021	Nat BHCs	13.214	101.478	12.113	32.674
6022	State BHCs	13.347	31.385	15.171	32.555
6211	Sec-B/D/Ft	13.056	204.661	1.345	55.941
6282	Sec-Inv Adv	22.615	46.312	16.618	79.478
6311	Ins-Life	12.282	8.820	12.529	36.097
6331	Ins-F/M/C	15.639	21.854	11.820	35.099
6411	Ins-Agt/Br	19.871	115.652	9.000	92.240
6500	RE-Other	4.312	171.472	2.714	111.352
6512	RE-Nonres	7.014	248.014	6.133	56.708
6519	RE-Lessor	2.476	77.600	3.750	68.492
6531	RE-Agt/Man	5.722	189.321	-6.000	75.544
6552	RE-Devlpr	5.480	283.304	0.497	64.934

<sup>a</sup>Earnings are defined as income available to shareholders divided by the average accounting value of shareholders' equity.

## RESULTS AND ANALYSIS

Using the above methodology, we construct 4,580,532 combined firms to determine the potential effects of expanding bank powers. The results are reported in Tables 3 and 4.

Table 3 shows the results of the simulations using accounting earnings. The industries are ranked by the percentage of Beneficial Mergers for national BHCs. Intuitively, the median percent of Beneficial Mergers between Ins-F/M/C and National BHCs is 61.538. Of these firms that meet the Beneficial Merger, the average maximum proportion of Ins-F/M/C firms in the combined firm is 39.176 percent. Some interesting patterns emerge:

1. The insurance industry has relatively high percentages of Beneficial Merges and very high proportions tolerated.
2. The securities industry has relatively high percentages of Beneficial Mergers and relatively low proportions tolerated.
3. The real estate industry has relatively low percentages of Beneficial Mergers and relatively low proportions tolerated.

The significance of the proportion levels is that when the levels are exceeded, the benefits to diversification as defined by the Beneficial Merger standard disappear. These results are basically consistent for national and state BHCs.

**TABLE 3**  
**Earnings**  
**Ranked Industry Beneficial Merger Potential**

Industry	National BHCs		State BHCs	
	Percentage <sup>a</sup>	Proportion <sup>b</sup>	Percentage	Proportion
Ins-F/M/C	61.538	39.176	58.823	32.348
Ins-Agt/Br	61.112	29.277	61.111	28.928
Sec-Inv Adv	44.444	6.722	77.777	17.677
Ins-Life	42.105	35.236	39.473	32.077
Sec-B/D/Ft	38.461	19.055	41.987	16.677
RE-Nonres	14.705	3.181	12.121	2.294
RE-Other	11.786	1.138	11.764	1.411
RE-Devlpr	13.750	2.760	15.000	3.586
RE-Lessor	13.333	1.038	13.333	1.625
RE-Agt/Man	6.666	2.333	13.333	1.733

a. Median percentage of industry firms resulting in a Beneficial Merger. A Beneficial Merger is defined as a merger that either increases earnings at the same or lower risk of the bank before the merger; or, decreases risk at the same or higher earnings of the bank before the merger.

b. Given a Beneficial Merger, median maximum investment in industry firms.

Table 4 presents the results of the simulations for holding period returns. The results do change with the most interesting changes occurring in the securities industry. Sec-Inv Adv industry has the greatest potential for Beneficial Mergers. The results indicate that, in terms of Beneficial Merger potential, the Sec-B/D/F industry is about the same as the real estate industry. The three same basic conclusions listed above hold.

**TABLE 4**  
**Holding Period Returns**  
**Ranked Industry Beneficial Merger Potential**

Industry	National BHCs		State BHCs	
	Percentage <sup>a</sup>	Proportion <sup>b</sup>	Percentage	Proportion
Sec-Inv Adv	52.081	12.011	34.261	18.291
Ins-F/M/C	38.026	26.101	28.062	36.001
Ins-Agt/Br	32.161	30.671	21.170	26.712
Ins-Life	28.611	54.016	27.623	58.762
RE-Nonres	10.331	6.201	5.322	2.161
RE-Lessor	10.026	12.660	4.731	6.310
Sec-B/D/Ft	9.862	6.811	5.002	4.811
RE-Devlpr	4.210	3.810	4.621	7.160
RE-Agt/Man	3.801	4.209	3.987	2.500
RE-Other	2.611	1.542	2.361	1.980

a. Median percentage of industry firms resulting in a Beneficial Merger. A Beneficial Merger is defined as a merger that either increases returns at the same or lower risk of the bank before the merger; or, decreases risk at the same or higher returns of the bank before the merger.

b. Given a Beneficial Merger, median maximum investment in industry firms.

The policy implications given these results are intuitive. Insurance, particularly Ins-F/M/C and Ins-Agt/Br are highly attractive industries for bank expansion. The attractiveness of insurance is due to both the high percentages and high proportions. Securities, especially Sec-Inv Adv, are attractive areas for bank power expansion with the caveat that the level of security business should be limited. Bank power expansion in any area of real estate is not supported by this study.

## SUMMARY

BHCs and others have argued that greater business activity powers would enhance the safety and profitability of the banking industry due to diversification. Previous studies using simulation methodology assume no efforts to reduce risk are made when selecting hypothetical mergers. This study develops a methodology that sets a goal of reducing the risk of the BHC and measures the upper bound of diversification benefits. These upper bounds of diversification potential are examined and substantial potential for diversification benefits in some industries are found. This study provides evidence that supports expansion of insurance powers for BHCs on the basis of portfolio diversification benefits. There is limited support for expansion into the securities industry because the benefits are achieved with low proportions of securities business within the combined firm and these benefits disappear at higher proportions. Further expansion into the real estate business is not supported. However, since other important areas of risk (i.e. underwriting risk) are not captured by the simulation model, one must use caution in arguing for expansionary powers.

**TABLE 5**  
**Average Ranks**

Industry	Accounting Earnings		Holding Period Returns		Ave Rank
	National	State	National	State	
Sec-Inv Adv	3	1	1	1	1.50
Ins-F/M/C	1	3	2	2	2.00
Ins-Agt/Br	2	2	3	4	2.75
Ins-Life	4	5	4	3	4.00
Sec-B/D/Ft	5	4	7	6	5.50
RE-Nonres	6	9	5	5	6.25
RE-Lessor	9	7	6	7	7.25
RE-Devlpr	8	6	8	8	7.50
RE-Agt/Man	10	7	9	9	8.75
RE-Other	7	10	10	10	9.25

## ENDNOTES

1. "Banking" and "Banks" are used in this paper as generic terms. "Banks" refers to either a bank or a bank holding company. It is almost certain, however, if banks are allowed additional powers of the sort this paper describes, such powers would be granted as a subsidiary of a bank holding company.
2. Briefly BG's results are: BHC-Life Insurance (*Standard Deviation* = .0201 / *Returns* = 12.95); BHC Alone (.0245 / 13.12); BHC-Insurance Agent/Broker (.0302 / 15.59); BHC-Property/Casualty Insurance (.0432 / 12.97).
3. Regulators are concerned with maintaining a safe and sound banking system, which necessarily includes the management of the deposit insurance fund. Therefore, given the current structure of the deposit insurance and the highly leveraged position of the banking industry, any activity that increases the risk of the banking industry is of concern, since the increase in risk is borne largely by the fund (and ultimately, the taxpayers), not the bank.  
The concern is an absolute change in risk, not, as some researchers have implied, whether currently permissible activities are more or less risky than prohibited activities. An increase in risk with an appropriate level of return is also not acceptable from the regulators' point of view, since any upside gain is captured by the bank while downside losses are absorbed by the depository insurance fund.

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