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BANK HOLDING COMPANY DIVERSIFICATION INTO NONBANK FINANCIAL SERVICES: A SIMULATION STUDY

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I. Introduction

There is much current discussion about letting bank holding companies (BHCs) engage in certain financial lines of business outside banking. Large BHCs have expressed keen interest in such activities as investment banking, full service securities brokerage, insurance, and real estate investment and development. These BHCs argue that commercial bank profitability in recent years has been adversely affected by the entry of nonbank firms into traditional banking activities, whereas commercial banks are prohibited by regulation from entering lucrative nonbank activities.[1] Recently, this argument has picked up considerable support from bank regulatory agencies, the Administration and the Congress. Several bills have been introduced in Congress that would lower the barriers for BHC entry into one or more of these activities.

One of the principal issues surrounding the debate involves the added risk to bank subsidiaries if a BHC were to enter these currently prohibited activities. Critics of expanded BHC powers argue that many of the sought-after nonbank activities are quite risky relative to commercial banking. If BHCs are permitted into them, they say, the incidence of commercial bank failure--or its common analogue, the FDIC rescue--will surely increase. As a practical matter, separating the risk of the bank subsidiary from the risk of the entire BHC is extremely difficult. Thus, in this study we treat BHCs as consolidated organizations which survive or fail as single entities.

Proponents of expanded powers for BHCs have espoused three views on risk effects. One is that risk, as measured by the variability of BHC profits, would actually decline because of the effect of asset diversification. A second view is that the variability of profits might rise, but the risk effect would be offset by a commensurate rise in average profits, so that the incidence of BHC failure would actually decline. A third view is that whatever added risk may occur doesn't really matter, because commercial bank subsidiaries can be legally protected against adverse results originating in nonbank subsidiaries. The essence of the third view is that legal "walls" can be built around the commercial bank subsidiary to insulate it from any risky activity conducted by the parent BHC or by a nonbank subsidiary. This is particularly true, it is argued, if the nonbank activity is placed in a subsidiary of the BHC rather than in a subsidiary of the commercial bank.

As discussed elsewhere we find this view fundamentally flawed.[2] As long as corporations have a common parent, they will have a commonality of interests, imposed from the top if not from within. Inevitably, this commonality will produce incentives for cross-subsidization between subsidiaries, and under the right circumstances such incentives may be very strong. There are a myriad of ways in which cross-subsidization can be achieved, with some of them, undoubtedly, still waiting to be discovered. The entire history of Fed supervision in this area suggests that it is almost impossible for regulators to thwart such interaffiliate transfers when management is determined and creative.[3]

Apart from the third view, the debate seems to revolve around the risk/return characteristics of the prohibited industries. Yet, there has been surprisingly little formal research on this topic. Few studies are presently available that provide evidence on the likely risk/return outcomes when BHCs enter currently prohibited industries.

A major objective of this study is to partially fill that void. The question we address is: Will the risk of bankruptcy increase if BHCs are permitted to engage in certain prohibited activities? The prohibited activities we study are: securities, insurance, and real estate. As a guide to what is likely to happen in the future, we examine what might have happened historically if BHCs had been permitted to merge with existing firms in these industries. We employ a measure of the risk of failure (bankruptcy risk) that takes into account the average rates of return, the variability of rates of return, and the level of capitalization. This permits us to make explicit, and empirically test, the second view--that mergers would reduce risk because increased average rates of return will offset increased variability of rates of return.

Our study has two parts. First, we analyze the risk/return characteristics of the subject industries. Using both accounting and market data for 249 banks and nonbank financial firms over the period 1971-1984, we compute sample statistics which measure both profitability and risk for each industry. Obviously, industry statistics can only tell us about the profitability and riskiness of the individual industries. They cannot indicate the

potential impact of diversification when these activities are combined with banking in a single holding company. Nonetheless, these industry statistics serve a useful purpose. Much of the current debate is over the relative riskiness of the various industries, themselves.

The second part of our study analyzes the effects of BHC diversification into currently prohibited industries. We simulate mergers between BHCs and nonbank firms as if such mergers had been permitted historically. This approach permits us to generate data for hypothetical industries, for example, the "BHC and life insurance industry," which never actually existed. Risk and return statistics are generated for these hypothetical industries and are then compared to risk and return statistics for the unmerged BHC industry. One advantage of this procedure over that employed in previous studies is that it does not require estimation of return distributions for the underlying industries and thus avoids many problems of statistical inference.[4]

Summary of Findings

The industry data suggest that securities firms have been considerably more profitable and also more risky than BHCs. When we simulate mergers between firms in these two industries, returns to BHCs increase, but there is a substantial increase in their risk of failure, too. Industry data as well as simulation results suggest much the same conclusion for real estate activities, at least as far as risk is concerned. These lines of business are generally more risky than banking, and BHC diversification into them is likely to increase risk of failure, not reduce

it. Thus, the "second view"--that the higher profitability of nonbank activities will more than compensate for their greater volatility--is not supported by the data for securities and real estate firms.

Analysis of industry data suggests that risk and returns in the insurance industry have been much closer to those observed in BHCs. Nonetheless, it appears that there may be genuine opportunities for risk reducing diversification. This is particularly true for the life insurance business. Simulated mergers between BHCs and life insurers resulted in decreases in all risk measures studied, while profitability was little affected.

II. Methodology

A. Accounting and Market Data

Risk and return measures are computed using both accounting (book) and market (stock price) data. Each data source has advantages and disadvantages. A widely recognized problem with accounting data is the intentional smoothing of reported profits. Commercial banks, for example, are permitted by their regulators to value assets and liabilities at acquisition (historical) costs, rather than at their market values (i.e., they do not mark to market). Since all our risk measures depend, directly or indirectly, on the volatility of profits, this is a potentially important problem. Market returns as reflected in stock prices are not intentionally smoothed. Results with the sample firms, which we discuss in Section III, indicate that market returns are indeed much more volatile than accounting returns, for all industries studied.

This finding surely reflects intentional accounting smoothing, at least to some extent. But it could reflect other factors as well. In particular, market returns may reflect random noise, or at least some kind of exogenous shocks, which are unrelated to the true profitability of the firm. Indeed, it remains an unanswered puzzle as to why market returns are consistently as volatile as they are. (Mehra and Prescott [1985]).

We realize that neither data source is without potential problems. Thus, we chose to use both in this study. As it turns out, most of our results are unambiguous and do not depend upon the use of one kind of data or the other. However, a few results are ambiguous in this sense. This led us to consider methods of independently determining which sort of data is best for measuring risk. These tests, which will be presented in Section VI, strongly support the use of accounting data.[5]

B. Definition of Variables

Define A = total assets, E = total equity, L = total debt, π = net income after taxes, P = price per share (adjusted for stock splits and stock dividends), D = cash dividends per share (adjusted for stock splits and stock dividends), and C = number of common shares outstanding. Further, define three subscripts: t = time period, i = industry, and f = firm in industry. Thus, for example, A_{111} denotes the total assets of firm one, in industry one, in year one of our sample.

Profitability Measures. Three measures of profitability are employed. Temporarily suppressing the f and i subscripts, the first is the rate of return on average accounting assets, ra, defined

$$(1) \qquad (ra)_t = \frac{2\pi_t}{A_t + A_{t-1}};$$

the second is the rate of return on average accounting equity, re, defined

$$(2) \qquad (re)_t = \frac{2\pi_t}{E_t + E_{t-1}};$$

and the third is the market rate of return on equity, rm, defined

$$(3) \qquad (rm)_t = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}.$$

Risk Measures. Four risk measures are employed. The first two are the standard deviations of the return on average accounting equity, s_{re}, and market equity, s_{rm}, defined generally

$$(4) \qquad s = \left\{\frac{\sum_{t=1}^{N} (r_t - \bar{r})^2}{N-1}\right\}^{1/2},$$

where N is the number of years in the sample period.

The third and fourth risk measures are indicators of the probability of bankruptcy, Z, defined for both accounting and market data. The general formula is

$$(5) \qquad Z = \frac{(\overline{E/A}) + (\overline{ra})}{s_{ra}}.$$

E/A is the ratio of average equity to average assets,

$$(6) \qquad E/A = \frac{E_t + E_{t-1}}{A_t + A_{t-1}},$$

and s_{ra} is the standard deviation of (ra). For any particular firm, $\overline{E/A}$ and $\overline{ra}$ are sample means, and s_{ra} is estimated over the sample period. For the market definition of Z, we define the values of π, E, and A as

$$(7) \qquad \pi^m = \frac{1}{2}(rm)*(C_t+C_{t-1}),$$

$$(8) \qquad E^m = C_t*P_t,$$

and

$$(9) \qquad A^m = L^a + E^m,$$

where the superscript m denotes market value and the superscript a denotes accounting value. In (9), we assume that the accounting value of debt is a reasonable proxy for its market value.[6]

The risk measure, Z, is formally derived and discussed in some detail in Boyd and Graham [1986] and in Wall [1986], and we will not discuss it in great detail here. Intuitively, Z is an estimate of the number of standard deviations below the mean by which profits would have to fall so as to render equity negative. Negative equity is, of course, one common definition of bankruptcy and, therefore, a higher value of Z is associated with a lower probability of bankruptcy. Note, further, that the predicted probability of bankruptcy is quite intuitive: It increases with the variability of returns, s, decreases with the average ratio of net income after taxes to assets, ($\overline{ra}$), and decreases with the average ratio of equity to assets ($\overline{E/A}$). As mentioned earlier, Z takes account of the joint effect of mean rates of return and the volatility of returns. Thus, this statistic can be used to test the "second view," that increases in average returns offset increases in volatility of returns.[7]

C. Data Sources

All of our data come from Standard and Poor's COMPUSTAT tapes and cover the years 1971-1984. This source provides both market and accounting data. Included in the sample are 146 BHCs, 11 securities firms,[8] 30 life insurance companies, 15 property and casualty insurers, 5 insurance agents and brokers, 31 real estate development companies, and 11 "other" real estate firms. Industry classifications are determined by Standard and Poor's. Not all sample firms have data in all sample periods, but we required that each sample firm have at least five years of data. The firms in our sample tend to be the larger ones in their respective industries and all are publicly traded. Information about the size distribution of firms in the sample appears in Table 1.

Our sample exhibits some characteristics that might or might not bias our results. The sample has an ex post selection bias since firms that merged, failed, or were delisted for any other reason during the sample period are not included in the COMPUSTAT files. We shall discuss this problem, along with other possible sources of bias, in Section VII. BHCs are much more heavily represented in the sample than are firms in the other financial industries. This was not a matter of choice but rather reflected what is available in COMPUSTAT. Since our merger simulations are not based on the proportion of one type of firm in the sample, this overweighting of banks should not bias any results.

D. Merger simulations

The method we use to analyze the impact of BHC diversification is to simulate hypothetical mergers between BHCs and nonbank firms. The idea is to see what effect such mergers might have had on return and risk had they been permitted in the early 1970s. Our assumptions concerning merger terms are extremely simple. We assume that firms merge at either accounting or market values, depending upon which data base we are using. Consolidated total assets, debt, equity, and profits are obtained by summing the entries for the two merging firms. Thus, we ignore synergies due to combination, out-of-pocket merger costs, merger premia, and changes in capitalization associated with combination. Obviously, these assumptions are not "realistic," and some will bias results in favor of such mergers, others in the opposite direction. However, there is a saving grace to this simplicity. It avoids the subjectivity inherent in the determination of hypothetical merger terms on a case by case basis. And importantly, it permits us to computer simulate a large number of mergers.

The actual simulations proceed as follows. First, choose a BHC and a nonbank merger partner at random. Second, merge them during the first period in which both firms are in the sample. Third, compute consolidated total assets, debt, equity, and profits for the merged firm from the year of merger onward. This is done using both accounting data and market data. Fourth, using these two time-series, calculate annual returns for the merged firm. Fifth, compute summary measures of return and risk, for each industry. Sixth and finally, save these summary measures

for the hypothetical merged firm, randomly choose another pair of firms, and repeat the entire process. This procedure was repeated 100 times for each nonbank industry, so that we have 100 hypothetical mergers of BHCs with securities firms, 100 of BHCs with life insurers, and so on. In this manner, we generated data for six new "industries."

III. Results: Industry Statistics

A. Accounting and Market Data

Table 3 compares the accounting data to market data with respect to the volatility of the return on equity. As expected, the return on equity based on market data is more volatile than that based on accounting data for all seven industries. However, as column 3 shows, the differences between accounting and market volatility are greatest for BHCs and life insurance companies; the latter being an industry like banking that smooths its profits because it carries substantial assets on its balance sheet at cost.

B. Profitability Measures

Table 2 shows the median return on equity and median capitalization for the seven industries in our study. We prefer using the median rather then the mean statistic because the median avoids distortions caused by a few outlying data points. Our analysis throughout this paper focuses on median statistics, although in most cases they are little different than the means.

Return on equity of the BHC industry measured either on the basis of accounting or market data, ranks about in the middle

of the seven industries. Accounting data show that BHCs, with a return of 13 percent, are substantially below securities firms and the same relationship holds for market data, as well. With either measure BHC returns are roughly comparable to life and property and casualty insurance industries and exceed those of other real estate firms. BHC ranking with respect to insurance agents and real estate developers depends on which data base is employed.

In sum, except for the securities industry, these data do not support the contention that large BHCs have been less profitable than other financial industries. Undeniably, BHC profitability over the sample period was much below that of securities firms, as proponents of liberalized legislation claim. However, as shown next, securities is also a far riskier industry.

C. Risk Measures

The first risk measure in Table 3 is the median standard deviation of the return on equity, shown for both accounting and market data. Based on accounting data, BHCs have the lowest risk, closely followed by life insurance. The highest risk is associated with real estate and securities firms. According to market data the lowest risk industries are property and casualty insurance and insurance agents, followed closely by BHCs and life insurance. Real estate and securities firms are again on the high end.

The second risk measure in Table 4 is Z (or the Z-score, as it is often called), and the reader is reminded that Z-score and risk are inversely related. The market Z-scores are consistently much smaller than the accounting Z-scores. This difference

was to be expected and reflects the greater volatility of returns to equity on a market basis relative to an accounting basis. Magnitudes notwithstanding, the results are quite similar in terms of rankings. Banks and insurance firms are considerably less risky (i.e., have higher Z-scores) than securities and real estate firms. Accounting data suggest that BHCs are less risky than insurance firms but that conclusion is not supported by market data.

Summarizing the evidence from the Z-score and standard deviation measures of risk, it is clear that the highest risks are associated with securities and real estate firms. Identifying the lowest risk industries depends on which set of data are employed. Accounting data point to BHCs while market data suggests companies in one or more insurance industries. But clearly, BHCs are a much less risky industry than either securities or real estate.

Some proponents of expanding permissible BHC activities would not dispute these findings. They would argue, however, that industry risk is not the relevant risk when discussing the expansion of BHC powers. The relevant risk, they would say, is the risk to firms undertaking a combination of banking activities and the currently prohibited activities. In their view, combining activities might in fact reduce the volatility of returns below that of undiversified BHCs. It is that contention that we next address.

IV. Results of Hypothetical Mergers Between One BHC and One Nonbank Firm

A. Rates of Return

Rate of return statistics for the simulated mergers of one BHC and one nonbank firm over the period 1971-1984 are presented in Table 4. For purposes of comparison, statistics for the unmerged BHC industry are also shown as a memo item in the last row.

Results in Table 4 generally reflect the differences in median rates of return between industries, which we have already discussed. According to the simulations, BHCs could probably have increased their rates of return on equity, either market or book, by diversifying into the securities industry as proponents have claimed. However, for mergers involving any other industry, gains are either not likely or are dependent on one or the other of our data bases. The absence of measurable increases in returns on equity rests on two factors. Either rates of return for BHCs were not much different than rates of return in the other industries, or BHC's share of consolidated assets after merger was large. The median BHC share of post-merger consolidated accounting assets is reported in the last column of Table 4. These numbers clearly reflect the large size of BHCs in the sample relative to that of most firms in the other industries.

At this point the reader is probably asking, "Why not simply look at mergers with larger nonbank firms?" There are two responses to this anticipated question. First, we cannot create merger opportunities that did not exist. If a firm is large and

publicly traded, it typically is listed on COMPUSTAT. Put another way, one factor which may tend to limit opportunities for diversification by large BHCs into other financial industries is the sheer size of banking. We are surely not the first to make this point. Another answer is, "Wait a moment." As we shall see, the risk effects of hypothetical mergers may be substantial, even though the nonbank merger partner is relatively small.

B. Risk Measures

The risk effects of the hypothetical merger between a BHC and a firm in another industry are shown in Table 4. As before, two measures of risk are shown--median standard deviation of the return on equity and median Z-score. For purposes of comparison these risk measures are also shown for the unmerged BHC industry.

Consider first the standard deviation risk measure. Risk worsens (i.e., risk is higher compared to the unmerged BHC industry data) substantially for mergers with securities firms and somewhat less so for mergers with real estate companies. This is the case with both accounting and market data. Results are mixed with respect to mergers with property/casualty insurers and insurance agent/broker firms, and depend on which data base is used. When accounting data are used risk worsens and vice versa for market data. Only in the case of mergers with life insurance firms does risk decline regardless of data base.

Consider next the Z-score. The results here are quite similar to those with standard deviations. Bankruptcy risk worsens when BHCs merge with securities and real estate development

firms. Results for mergers involving property/casualty insurance companies, insurance agent/brokers, and other real estate firms depend on the data base employed, with risk falling for market data and rising for accounting data. For mergers with life insurance firms the risk measure unambiguously declines.

Summarizing, we find that mergers between BHCs and securities firms are likely to increase profitability. They are not, however, likely to result in the reduced risk of failure that advocates of such a step have predicted. If anything, such mergers are likely to increase BHC risk. The same conclusions about risk can be said of BHC mergers with real estate firms although the results for other real estate firms are not altogether unambiguous. On the other hand, it appears that mergers between BHCs and life insurance firms may well produce desirable diversification effects.

V. Mergers with three firms

Proponents of expanded BHC powers would probably argue that the prospects for risk reduction increase with the number of new industries BHCs may enter. Unfortunately, the possible combinations of BHCs with other industries are far too many to analyze in this paper.[9] However, we do examine three-industry mergers involving combinations of a BHC and a securities firm with a firm from one of the remaining five industries. We selected the BHC-plus-securities industry combination in this particular exercise because much of the proposed legislation specifically involves opening up the securities industry to BHCs. The idea of this set of tests was to see if, by adding a third industry, the

undesirable risk effects of BHC-securities mergers could be mitigated.

Table 5 shows the results of these simulated three-firm mergers. Three-firm returns on equity turn out to be always higher than that for the BHC industry alone, regardless of which third industry is included, or what data base is employed. This outcome was expected because of the inclusion of the highly profitable securities industry.

Turning to the risk measures in Table 5, two sets of statistics are unambiguous. First, consider the three-industry combinations involving BHCs, securities firms, and either one of the real estate categories. Such combinations are more risky than BHCs alone, according to all four risk measures. Second, consider only the risk measures based on accounting data. According to these statistics, all the three-firm combinations in Table 5 are more risky than BHCs.

With some combinations of industries, however, risk statistics computed with market data signal different results than do those computed with accounting data. For example, when market data are employed, some risk reduction may be achieved by combinations including property and casualty insurers or insurance agents. And according to the Z-score computed with market data, the three-firm combination of BHCs, securities firms, and life insurance also results in some risk reduction vis-a-vis BHCs alone.

Summarizing the results, the tests suggest that mergers involving BHCs, securities firms, and real estate firms increase

returns, but also generally increased risk. Results conflict for mergers involving BHCs, securities, and insurance firms. In those simulations, market-based risk measures are generally lower than those for BHCs alone, whereas accounting based risk measures are higher.

VI. The Risk Measures: Are Accounting Data or Market Data Better?

In at least some cases, market and accounting data produce conflicting risk rankings. This led us to consider methods of testing which data source was best for the purpose of measuring risk.

The debt rating agencies make use of accounting data, market returns, and indeed all publicly available information about firms whose debt they evaluate. Moreover, they are primarily interested in the likelihood of failure, which is the kind of risk our Z-scores are intended to capture. Thus, debt ratings are arguably a useful alternative risk measure against which to test our Z-scores.

We obtained Moody's commercial paper ratings for all BHCs in the sample that were rated at the end of 1984. There were 71 altogether; 48 with paper rated P1, and 23 with paper rated P2 and lower. Two simple tests were then conducted. The first was a two-way analysis of variance of Z-scores against the commercial paper ratings. With accounting data, the mean Z-score of P1 firms was 60.8; for P2 firms it was 44.5. Using the standard F-test, these means were significantly different at the 95 percent confidence level. With the market data, mean Z-scores were 4.2 and

4.0, respectively, with only about 44 percent confidence that the true means were different.

Next, we used the Z-scores to classify BHCs into "low risk" and "high risk" groups according to the commercial paper ratings. Only "outlying" BHCs, those with Z-scores more than one standard deviation from the mean, were used in this procedure. The accounting Z-scores correctly classified 15 out of 17, whereas the market Z-scores correctly classified only 7 out of 15.

In sum, the accounting Z-scores appear to contain some of the same information that is in the commercial paper ratings. The market Z-scores do not. To the extent, therefore, that commercial paper ratings are useful measures of bankruptcy risk (and we think they are) this finding would favor the use of Z-scores computed with accounting data.

VII. Possible Sources of Bias in the Testing: Discussion

Our findings obviously hinge on the nature of the experiments, the assumptions, the sample and the data. These are subject to question and we shall try to address some anticipated questions in this section. While there are some biases which would tend to weaken our results, there are also factors which strengthen them. We briefly address a number of these pro and con points beginning with those that may weaken our results.

A. Merger Partners Chosen at Random

One argument might address the rationality of merger partners chosen at random, as is assumed in our experiment. It could be argued that a "smart" BHC is not going to merge with a

high risk nonbank. We don't necessarily believe this presumption given the government's predisposition to save large failing banks. Moreover, there are a limited number of merger candidates among large nonbank financial firms. When the low risk ones are picked, what remains are the riskier firms.

B. Economies of Scale and Scope

Yet another argument might be that we ignore any potential for synergisms or economies of scale in our simulated mergers. Presumably the merged firm would produce higher Z-scores because synergisms and economies of scale would improve profitability. We question the existence of economies of scale. Most available studies indicate that they have not been detectable in banking beyond a very modest size. Nonetheless, we do recognize the potential gain stemming from synergisms (or economies of scope). With our methodology, it is simply not possible to capture such effects.

We turn next to sources of bias that would tend to strengthen our results.

1. Selection Bias

First, our sample has a form of selection bias. It does not include any nonbank firms that failed during the sample period. Undoubtedly there were some failures since nonbanks did not have a "savior" regulatory agency. On the other hand the sample does contain some BHCs, (e.g., First Pennsylvania and Continental Illinois) which in the absence of federal intervention might well have failed. This selection bias has the effect of understating

methodology tend, if anything, to understate the strength of our conclusions.

VIII. Summary and Conclusions

The results of this analysis cast doubt on two important assertions made by proponents of expanded powers for BHCs, particularly in the areas now served by the securities and real estate industries. One is that BHC expansion into those industries would reduce risk. We found some evidence that this perhaps is true in the case of insurance activities in one or more of its classifications--life, property, casualty, agency, brokerage. But it was generally not the case with respect to the securities and real estate industries. If anything, our tests suggest that entering these lines of business would increase BHC risk.

The second assertion is that any added risk that might occur when currently prohibited activities become permissible would be fully offset by increased profitability. Our results do not support this claim, either. Our measure of bankruptcy risk, which "nets out" the offsetting effects of increased mean and variance of profitability, indicates that the claim may be justified in the case of the insurance industries but is not justified with respect to securities and real estate.

If our conclusions are correct, the need to devise fire walls to insulate commercial bank subsidiaries from risky prohibited activities, such as the securities and real estate industries, is greater than generally perceived. It is our view, however, that any fire walls that solve the risk problem are also likely to deprive BHCs of scope efficiencies. Thus the public

benefits of permitting expanded activities for BHCs in these areas are likely to be illusory. On the other hand, if policymakers are intent on granting BHCs wider powers in order to improve their competitive status, our results suggest that they should look to the insurance industries.

Footnotes

[1]The authority to permit BHCs to enter nonbank activities resides in the Federal Reserve. The Bank Holding Company Act of 1956 and its subsequent amendments authorize the Fed to determine what nonbank activities are permissible for a BHC (defined as a holding company controlling one or more banks). The basic criteria are that the permissible activity must be closely related to banking and that it provide benefits to the public. A BHC's entry into permissible activities requires prior approval by the Fed. The Bank Holding Company Act prohibits BHCs from engaging in insurance activities apart from certain exceptions. To what extent the Fed may permit BHCs to engage in securities activities is unclear because the Banking Act of 1933 (Glass-Steagall Act) prohibits banks from engaging in both commercial banking and investment banking. In early 1987 the Fed permitted BHCs to engage in underwriting commercial paper, 1-4 family mortgage-backed securities and municipal bonds, activities that it believed were not prohibited by Glass-Steagall. Later, Congress imposed a temporary moratorium (until March 1988) on these activities so that it could examine the issue of separation of banking from securities activities.

[2]Boyd and Graham [1986].

[3]Obviously, it is possible to impose such an extreme degree of corporate separateness that problems in one affiliate cannot spread to another. For example, regulation might prohibit any interaffiliate transactions and any sharing of management, whatsoever. However, such restrictions would also preclude any

advantages in combining banking with nonbank lines of business; e.g., economies of scale and scope. Besides, investors can already create such combinations themselves, by buying shares in (say) a bank, a life insurance company, a brokerage, and so on. It seems fair to say that no one views complete corporate separateness as a desirable approach. What is sought, instead, is a system which permits BHC affiliates to operate much like a single consolidated firm, except for the transmission of losses to bank affiliates. We doubt it is possible to create such a system.

[4]One way to empirically estimate potential diversification effects is to estimate return distributions and correlation matrices for each industry. This has been done in a number of previous studies. (See, for example, Boyd and Graham 1986.) A difficulty with that approach, however, is that there are severe problems of statistical inference. The distributions often do not have many of the desirable properties which are typically assumed a priori by researchers. For example, they may not be joint-normal or time-stationary. In addition, firms effects may be as large or larger than industry effects, meaning that industries are either inherently heterogeneous or just badly defined.

[5]Other researchers have also found a dating problem with market data which they term "look-ahead bias." They found that market prices respond to published accounting data. The publication date of financial data typically lags the end of the reporting period by two or three months. Therefore, computing market returns based on stock prices for the same date as the end of the accounting period may imply that the investor is able to forecast without error. (See, for example, Banz and Breen 1986.)

[6]This assumption can be questioned on two counts. First, some debt may be long-term and second, preferred stock is treated as debt. Both factors could produce material differences between accounting and market values. Thus A^m should be regarded as a rough estimate.

[7]The classic, and perhaps still most elegant, discussion of Z-score type risk measures is in Roy [1952].

[8]In this study we use the term "securities" to represent all the activities engaged in by firms in this industry including investment banking and brokerage.

[9]With seven industries there are, in total, 66 possible combinations involving BHCs and one or more other industries. Our simulations require many computations, and to look at that many cases would be prohibitively expensive. In addition, exhaustively looking at all possible cases would raise the possibility of obtaining what <u>appeared</u> to be a good (high return, low risk) combination, merely by chance.

[10]Other studies have found that newly acquired nonbank subsidiaries are less profitable than their unaffiliated peers, suggesting the existence of a learning curve. This effect would tend to reduce profitability thus reducing Z-scores. (Rhodes [1975,1980], Rhodes and Boczar [1977].)

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Table 1

Number and Size of Sample Firms

Average Total Assets 1971-1984 ($ million)

Industry	Number	Median Assets	Smallest	Largest	Mean Assets
BHC	146	$2567	$307	$86267	$6455
Securities	11	472	84	12159	3677
Life Insurance	30	1004	13	28196	3051
Property/Casualty Insurance	15	2590	62	16501	3546
Insurance Agent/Broker	5	553	108	584	407
Real Estate Development	31	112	6	772	137
Other Real Estate	11	129	16	831	252

Table 2

Profitability Measures by Industry

Annual Data 1971-1984

Industry	Median Return on Equity		Median Capital/Asset Ratio	
	Accounting	Market	Accounting	Market
BHC	.1312	.1562	.0580	.0500
Securities	.1652	.2865	.2005	.2242
Life Insurance	.1282	.1464	.2055	.1797
Property/Casualty Insurance	.1344	.1579	.2206	.2719
Insurance Agent/Broker	.1998	.1023	.3728	.4986
Real Estate Development	.1003	.2012	.2749	.2917
Other Real Estate	.0065	.1546	.2441	.3022

Table 3

Risk Measures by Industry

Annual Data 1971-1984

Industry	Median Standard Deviation of Return on Equity			Median Z-Score	
	Accounting	Market	Market/ Accounting	Accounting	Market
BHC	.0245	.2703	11.03	43.36	3.916
Securities	.0909	.5248	5.77	13.33	1.954
Life Insurance	.0261	.2924	11.20	36.79	3.906
Property/Casualty Insurance	.0467	.2499	5.35	24.56	4.124
Insurance Agent/Broker	.0554	.2458	4.44	15.97	4.036
Real Estate Development	.1382	.6441	4.66	8.66	1.744
Other Real Estate	.0925	.6430	6.95	12.98	1.885

Table 4

Risk and Return Statistics Based on Simulated Mergers
of One BHC With One Firm in Another Industry*
Annual Data 1971-1984

Simulated Industry	Median Return on Equity		Median Standard Deviation of Return on Equity		Median Z-Score		Median BHC Share of Consolidated Assets
	Accounting	Market	Accounting	Market	Accounting	Market	
Securities	.1406	.2156	.0480	.3636	24.93	3.279	.79
Life Insurance	.1295	.1530	.0201	.2366	49.30	4.646	.71
Property/Casualty Insurance	.1297	.1477	.0432	.2218	25.28	5.137	.62
Insurance Agent/Broker	.1559	.1211	.0302	.2029	33.28	5.468	.91
Real Estate Development	.1008	.1582	.0419	.3006	28.82	3.596	.94
Other Real Estate	.1246	.1482	.0256	.2766	37.86	3.978	.97
Memo: BHC Industry	.1312	.1562	.0245	.2703	43.36	3.916	1.0

*Based on 100 random simulated mergers.

Table 5

Risk and Return Statistics Based on Simulated Mergers of One BHC With One Securities Firm and With One Firm in Another Industry*

Annual Data 1971-1984

Simulated Industry	Median Rate of Return on Equity		Median Standard Deviation of Return on Equity		Median Z-Score		Median BHC Share of Consolidated Assets
	Accounting	Market	Accounting	Market	Accounting	Market	
Life Insurance	.1402	.2027	.0311	.2758	34.26	4.000	.51
Property/Casualty Insurance	.1453	.1946	.0397	.2373	27.01	4.682	.40
Insurance Agent/Broker	.1745	.1673	.0453	.2181	23.17	5.184	.68
Real Estate Development	.1419	.2680	.0516	.4207	20.79	2.789	.61
Other Real Estate	.1338	.2208	.0508	.3350	23.53	3.259	.74
Memo: BHC Industry	.1312	.1562	.0245	.2703	43.36	3.916	1.0

*Based on 100 random simulated mergers.