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Diversification, Organization, and Efficiency: Evidence from Bank Holding Companies

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Abstract: We use a portfolio-simulation technique to estimate the value added from diversification by bank holding companies. Using a sample of 412 multi-bank bank holding companies (MBHCs) from 1990 to 1994, we construct pro forma benchmark portfolios for each MBHC composed of shares of single banks, weighted to correspond to the MBHC's distribution of activities. We then compare the performance and characteristics of the MBHCs to that of their pro forma benchmarks. Diversification through the holding company structure does appear to bring certain benefits: the MBHCs hold less capital and engage in more lending, on average, than their pro forma benchmarks. However, these desirable characteristics do not translate into higher profits, implying some organizational inefficiencies inherent in the holding company structure. This suggests that banks should be allowed to realize the benefits of diversification without limiting them to a particular organizational form.

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1 Introduction

A recent wave of takeovers, restructurings, and consolidations in the banking industry—highlighted by the 1995 acquisitions of Chase Manhattan by Chemical and First Interstate by Wells Fargo—raises new questions about the efficient scale and scope of the firm in the financial services industry.¹ Traditional theories of bank behavior, derived at a time when banking was one of the most heavily regulated sectors of the economy, have been slow to address these developments. Until recently the size, product range, and internal organization of banks were prescribed within fairly narrow boundaries. Beginning in the early 1980s, however, changes in state-level branch-banking laws have given rise to new financial institutions such as the diversified, interstate, multi-bank bank holding company (MBHC). Why have such institutions appeared? Do these new forms of organization bring efficiencies, or merely build banking empires?

We propose a new test to evaluate the efficiency of diversification within the bank holding company structure. Most efficiency studies in banking compare individual banks to an industry-specific “best-practice” frontier. Instead, we focus on the bank holding company. We compare holding companies to pro forma, multi-bank portfolios composed of actual single banks, chosen and weighted to match the size and location of the MBHC’s subsidiaries. These pro forma holding companies capture the risk-smoothing benefits of diversification, thus giving us performance benchmarks for each diversified bank. By comparing the performance of the MBHCs with that of the pro forma benchmarks, we effectively estimate the benefits of diversification at the holding company level. This helps us determine if MBHCs are simply collections of smaller banks, or if they can generate organization-wide synergies or efficiencies.

The more general question is whether diversified financial services firms are more efficient than traditional, narrowly focused banks, insurance firms, and securities underwrit -

¹For details on the largest bank mergers of 1995 see Siems, 1996.

ers. Since 1987 bank holding companies have already been allowed to hold subsidiaries engaged in limited underwriting under Section 20 of the Glass-Steagall Act. Some observers argue that banks should be allowed to engage in such non-bank activities directly, diversifying internally rather than through the holding company structure. It is important, then, to know if the holding company structure itself has advantages, beyond those of asset diversification per se. We can address this issue by evaluating MBHCs relative to portfolios of assets that are similarly diversified, yet without the holding company structure. In this way we isolate the effects of diversification and organizational form.

We construct matching pro forma bank holding companies (“pro forma BHCs”) for a sample of 412 MBHC observations from 1990 to 1994. For each MBHC, we match its subsidiaries to randomly selected single banks (matched by size and state) and aggregate these single banks into a pro forma portfolio. We then compare the weighted average performance of the portfolio with that of the corresponding MBHC, using several performance indicators. Our analysis finds that MBHCs, on average, hold significantly less capital, and do significantly more lending, than their pro forma benchmarks. At the same time, these characteristics do not appear to translate into superior profit: the MBHCs perform about as well as the benchmarks in terms of return on equity, return on assets, and net interest margin. Thus while we find no evidence of empire building (inefficiency), we also do not find the efficiencies that should accompany these firms’ desirable balance-sheet characteristics.

Why can diversified MBHCs hold less capital and do more lending? The evidence suggests that these organizations can realize the benefits of risk reduction through geographic diversification, while also taking advantage of an internal capital market to reallocate resources within the firm. That a diversified MBHC made up of such subsidiaries will be able to hold less capital than a similar collection of stand-alone banks implies that this internal capital market is better able to provide funds than the external

financial markets. Similarly, a diversified MBHC can do more lending than a similar collection of stand-alone banks if the internal capital market can channel funds more quickly and efficiently toward high-yield projects available only to a particular subsidiary.

However, the holding company structure itself must have some inherent disadvantages—possibly a bureaucratic inefficiency associated with large size—preventing these firms from translating these characteristics into higher profits. This suggests that banks should be allowed to expand geographically to realize the benefits of risk reduction and gain access to internal capital markets, and they should not be restricted to doing so only within the holding company structure. More generally, our findings show that organizational form is important, and that further research on the effects of organizational form on behavior and performance is needed.

The remainder of the paper is organized as follows. Section 2 reviews the literature on diversification and organizational form, arguing that internal capital market efficiencies provide a compelling efficiency rationale for diversification. Section 3 describes our data and our procedure for estimating the benefits of diversification through the holding company structure. Results and discussion are presented in Section 4. Section 5 concludes.

2 Diversification, organization, and performance: an overview

Diversification has been widely studied in economics, management, and finance. The literature on bank structure suggests both efficiency and agency rationales for diversification. In the agency or “managerial entrenchment” view, managers diversify, especially by acquisition, primarily to increase their compensation, job security, or span of control (Amihud and Lev, 1981; Born, Eisenbeis, and Harris, 1988). In the efficiency view, product and market diversification allows banks to reduce firm-specific risk by holding a greater variety of assets and offering a greater variety of services (Saunders, Strock,

and Travlos, 1990). However, risk reduction is not a satisfactory efficiency rationale for diversification. At least in the case of publicly traded banks, shareholders can always reduce their risk by holding a diversified portfolio of nondiversified banks, gaining the risk-reduction advantages of diversification without incurring the costs of managing a large organization. For this reason, diversification would be beneficial only if it provides some kind of economies of scope.

There are at least two potential sources of scope economies in financial services: “internal” or cost economies of scope, in joint production and marketing, and “external” or revenue economies of scope in consumption. Internal economies of scope may come from excess capacity in computer and telecommunications equipment that can be used for a variety of products, or from customer information (credit histories, ratings, etc.) that can be used jointly to produce multiple outputs (Clark, 1988, Mester, 1987). External economies of scope exist if there are benefits to the consumer of “one-stop shopping” for various financial services (Berger, Humphrey, and Pulley, 1996).

All of these, however, explain only why certain combinations of output should be produced together—not why the joint production must take place within a single *firm*. The cost-saving advantages of joint production and marketing could be achieved by two separate firms contracting to share facilities, customer data, and marketing information. For the consumer, the advantages of one-stop shopping for bank, insurance, and securities transactions can also be realized by contractual agreements among the various providers. In neither case is integration necessary to enjoy the benefits of the scope economies, unless there are difficulties writing and/or enforcing the relevant contracts. In other words, the determining factor is the costs and benefits of *contracting*, not the technological advantages of joint production (Teece, 1980, 1982).

Williamson (1975, pp. 155-75) has offered an account of the multi-product firm based on intra-firm capital allocation. In his theory, the diversified firm is best understood as an

alternative resource allocation mechanism. Capital markets act to allocate resources between single-product firms. In the diversified, multidivisional firm, by contrast, resources are allocated via an “internal capital market”: funds are distributed among profit-center divisions by the central headquarters of the firm (HQ). This miniature capital market replicates the allocative and disciplinary roles of the financial markets, shifting resources toward more profitable activities. For a diversified bank, the internal capital market could shift funds to subsidiaries with sudden capital requirements, or to subsidiaries with access to particularly attractive lending opportunities.

According to the internal capital markets theory, diversified institutions arise when limits in the capital market permit internal management to allocate and manage funds more efficiently than the external capital market. This is because HQ typically has access to information unavailable to external parties, which it extracts through its own internal auditing and reporting procedures (Williamson, 1975, pp. 145–47).² Managers inside the firm may also be more willing to reveal information to HQ than to outsiders, since revealing the same information to the capital market would also reveal it to rival firms, potentially hurting the firm’s competitive position.³ HQ can also intervene selectively, making marginal changes to divisional operating procedures, whereas the external market can discipline a division only by raising or lowering the share price of the entire firm.

To sum up, the only theoretically satisfactory explanations for the diversified *firm*—that is, for the boundaries of the organization—are (1) internal capital markets (an efficiency explanation) and (2) empire building (an agency explanation). Empire building occurs when managerial discretion is sufficient to allow managers to diversify the firm’s activities by making acquisitions that benefit or entrench themselves at the expense of

²Myers and Majluf (1984) show that if the information asymmetry between a standalone firm and potential outside investors is large enough, the firm may forego investments with positive net present value rather than issue risky securities to finance them.

³Bhattacharya and Ritter (1983) model the tradeoff between the benefits of external finance and the loss of firm value from revealing private information to rivals. They find that limited revelation to outside parties can be sustained in equilibrium.

shareholders. If acquisitions are designed to build empires, then diversification will not be efficient.

Because we try to measure organizational, not technological, economies of scope, our approach differs from that used in the efficiency literature. Frontier models test for scale and scope economies *within* multi-product banks. We look for scope economies *between* the subsidiaries of a multi-bank bank holding company. Because we choose our matches according to characteristics of the subsidiaries, we take no position in the debate between the “production approach” and the “intermediation approach.”⁴ In the production approach banks are seen as transforming stocks of capital and labor into stocks of accounts (loans and deposits), measured by the number of accounts. In the intermediation approach, banks are seen as intermediaries transforming flows of deposits into interest-earning assets (loans), measured in dollar values. In either approach, economies of scope are due to combined use of some input(s). Instead, we look for economies of scope due to organizational form, not technology.

3 Data and methods

Our paper distinguishes between the internal capital market hypothesis and the entrenchment hypothesis through a matched-pairs test, comparing a sample of MBHCs with a matched sample of pro forma BHCs, constructed to match the MBHCs distribution of activities across bank sizes and states. The comparison assesses the benefits of the holding company structure independent of the benefits of diversification per se.

Data are taken from the quarterly Statements of Income and Condition (Call Reports) filed by commercial banks. We begin by considering all holding companies that (a) have two or more commercial bank subsidiaries and (b) are headquartered in two or more states. For the 1990–94 period (fourth quarters) this includes 952 MBHC observations

⁴The distinction is due to Humphrey, 1985.

with a total of 7,400 subsidiaries. For each year, for each subsidiary of each MBHC we select a matched pair from the universe of all single banks (including subsidiaries of one-bank holding companies) that during that year operated in the same state and were within 25% of the MBHC subsidiary in total assets. With these criteria we are able to match 5,949 of the 7,400 subsidiaries. In general, the subsidiaries that failed to match were the very largest and the very smallest. We only included in our final sample MBHCs for which we could match each subsidiary in each year, leaving 418 MBHC observations with all subsidiaries matched. Subsequently, six of the 418 were dropped due to missing balance sheet data. Using the matched pairs for the subsidiaries of each MBHC, we construct a pro forma BHC as a performance benchmark for its corresponding MBHC. Our final sample contains 412 multi-state, multi-bank bank holding companies and 412 matching pro forma holding companies.⁵

Table 1 provides descriptive statistics about the MBHCs and the pro forma BHCs. As is apparent from the table, the matching process produces pro forma BHCs with characteristics very similar to those of the MBHCs. The MBHCs average \$750.173 million in assets and cover a fairly wide range from \$19 million to \$9.8 billion. Similarly, the pro forma BHCs average \$720.395 million in assets, ranging from \$17 million to \$10.3 billion. For both the sample of MBHCs and the sample of pro forma BHCs, the number of states ranges from two to five, and the number of bank subsidiaries ranges from two to 33.

[Table 1 about here]

For each of the MBHCs and pro forma BHCs we examine three performance measures: return on equity (net income/total capital), return on assets (net income/total assets),

⁵Note that we treat each MBHC-year as a separate observation; we do not construct a set of pro forma BHCs for 1990 and then track them for four years. This yearly resampling raises the concern that a particular single bank could be matched repeatedly to make up of a given pro forma BHC. However, of the 1,521 single banks constituting the matched pairs for the four-year period, one was selected four times, five were selected three times, 74 were selected twice, and the remaining 1,354 were selected only once. All of the banks that appeared three or four times are fairly ordinary in size.

and net interest margin (net interest income/total assets). We also look at two additional, balance-sheet characteristics: capital-asset ratio (equity capital/total assets) and lending activity (total loans/total assets). These five variables were computed for each MBHC, and then a weighted average was calculated for each corresponding pro forma BHC. MBHC performance was also constructed as a weighed average of the commercial bank subsidiaries.⁶ Finally, for each of the five performance measures, we then test the hypothesis that the sample means of the two groups, MBHCs and pro forma BHCs, are significantly different.

4 Results

Results of the matched pairs tests are given in Tables 2 and 3. As evident from Table 2, the MBHCs hold, on average, almost one percent less capital relative to total assets than do the pro forma BHCs. For a large bank, this is a significant difference. Likewise, the MBHCs have lending-to-asset ratios over three percent more than the pro forma benchmarks. (Both are statistically significant at the 1% level.) As suggested above, we interpret this as evidence that MBHCs enjoy the benefits of both geographic diversification and access to internal capital markets. When a particular subsidiary needs additional funds it can draw those funds from another subsidiary within the holding company. This allows each subsidiary to hold less capital than a stand-alone bank with similar asset size and geographic characteristics, and thus the holding company itself will tend to hold less capital in the aggregate than a pro forma benchmark holding company. Similarly, the MBHC subsidiaries can rely on the internal capital market for loanable funds when high-yield projects become available. Since the MBHCs do appear to make more lending in the aggregate than their pro forma benchmarks, this internal capital

⁶This excludes other subsidiary activity, such as “Section 20” subsidiaries. Otherwise, it would be necessary to include small trading companies in the pro forma BHCs.

market must have some advantages relative to the external financial markets.

[Table 2 about here]

On the other hand, as shown in Table 3, we find no statistically significant performance differences between the MBHCs and the pro forma BHCs in average return on equity, return on assets, and net interest margin, again controlling for size and geographic diversification. For some reason, the desirable balance-sheet characteristics described in Table 2 do not translate into higher profits. However, because the MBHCs are at least no *worse* performers than the benchmarks, we do not take this as evidence for empire building. Rather, it indicates to us that the holding company structure itself has inherent drawbacks that counter the beneficial effects of lower capital holdings and higher lending ratios. There must be bureaucratic inefficiencies associated with large firms organized as holding companies.

[Table 3 about here]

Clearly, organizational form matters along with the distribution of activities. We find significant benefits to geographic diversification and the resulting opportunities for internal capital market allocation. However, the holding company structure prevents these benefits from being realized as higher profits. One implication of these findings is that banks should be allowed to enjoy the benefits of geographic diversification and access to internal capital markets, without necessarily restricting them to a particular organizational form.

5 Conclusions

We find that diversification through the holding company structure does appear to bring certain benefits. Diversified MBHCs can hold less capital and do more lending pro

forma benchmark portfolios. Nonetheless these MBHCs are somehow unable to translate these attributes into higher profits. We argue that this suggests inherent organizational disadvantages to the holding company form of organization. If so, perhaps banks should be allowed to realize the benefits of diversification without requiring them to adopt this particular organizational form.

Besides the comparison of MBHCs with portfolios of nondiversified banks, our technique could be used to evaluate other kinds of diversified financial services providers. Companies ranging from American Express to Sears, Roebuck to Ford Motor Co. engage in insurance, financing, and securities underwriting beyond their primary businesses. A key question in bank regulation and deregulation is whether banks are potentially better providers of such services than these firms whose core businesses are in seemingly unrelated areas. Our results should prove useful in a future study that includes these nonbank institutions as well.

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Table 1:
Descriptive Statistics for MBHCs and Pro Forma BHCs, 1990–94

	<i>n</i>	Mean	Standard deviation	Minimum	Maximum
Total assets, MBHCs	412	750,173	1,426,344	19,643	9,854,872
Total assets, pro forma BHCs	412	720,395	1388230	17,992	10,300,000
Number of banks (subsidiaries)	412	3.6578	3.5166	2	33
Number of states	412	2.0922	0.3363	2	5

Assets in thousands of US. dollars.

Table 2:
Balance-Sheet Characteristics of MBHCs and Pro Forma BHCs

	MBHCs	Pro Forma BHCs	Difference
Capital-asset ratio (equity capital/total assets)	0.08388 (0.00142) <i>n</i> = 412	0.09237 (0.00109) <i>n</i> = 412	-0.00848 **
Lending activity (total loans/total assets)	0.59195 (0.00596) <i>n</i> = 412	0.55949 (0.00565) <i>n</i> = 412	0.03246 **

** significant at the 1% level.

Standard errors are in parentheses. Significance is determined by a paired *t*-test.

Table 3:
Income Characteristics of MBHCs and Pro Forma BHCs

	MBHCs	Pro Forma BHCs	Difference
Return on equity (net income/total capital)	0.09411 (0.01799) <i>n</i> = 412	0.10058 (0.00933) <i>n</i> = 412	-0.00647
Return on assets (net income/total assets)	0.01011 (0.00052) <i>n</i> = 412	0.00952 (0.00034) <i>n</i> = 412	0.00060
Net interest margin (net interest income/total assets)	0.04116 (0.00040) <i>n</i> = 412	0.04066 (0.00051) <i>n</i> = 412	0.00050

** significant at the 1% level.

Standard errors are in parentheses. Significance is determined by a paired *t*-test.