Federal Reserve Bank of New York
Staff Reports

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Staff Report no. 211
June 2005

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JEL classification: G21, G28, L11, L89

Abstract

Despite recent innovations that might have reduced banks' reliance on brick-and-mortar branches for distributing retail financial services, the number of U.S. bank branches has continued to increase steadily over time. Further, an increasing percentage of these branches are held by banks with large branch networks. This paper assesses the implications of these developments by examining a series of simple branch performance measures and asking how these measures vary, on average, across institutions with different branch network sizes.

The key findings are that banks with 100 to 500 branches ("mid-sized networks") had lower bank-average deposits per branch and roughly equal volumes of small business loans per branch, but no reduction in net deposit costs, relative to banks with larger branch networks. When compared to banks with 100 or fewer branches, mid-sized branch networks had lower bank-average deposits and small business loan volume per branch, but had lower net deposit costs. The analysis shows no systematic relationship between branch network size and overall institutional profitability. The results imply that mid-sized branch networks may be at a competitive disadvantage, especially relative to the very largest branch networks.

Key words: banking, branch, deposits

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The Impact of Network Size on Bank Branch Performance

I. Introduction

Recent innovations in the delivery of retail financial services have raised questions about the role of bricks-and-mortar branches in the banking industry. The advent of Internet banking, the proliferation of automatic teller machines (ATMs), and the increasing reliance on centralized call centers, combined with post-merger pushes for efficiency, all seemed to challenge the traditional branch method of delivering banking services. Yet, in fact, the number of full-service branches in the United States has increased steadily since the early 1990s. Further, consistent with the general trend toward consolidation in the banking industry, these branches have become increasingly concentrated within the large branch networks of a limited number of institutions.

The implications of these branching trends for bank customers and for banking institutions have been relatively unexplored. While a number of papers have examined the impact of the emergence of large, multi-market banks (Berger et al. 2005; Hannan 2004; Hannan and Prager 2004a, 2004b; Park and Pennacchi 2004), most of these papers have focused on asset or deposit size, rather than branch network size, as the key measure of institutional scale. But a direct focus on branches may be important in trying understand the evolution of retail banking activities. In particular, it has been argued that bricks-and-mortar branches are a comparatively expensive means of delivering retail financial services, particularly deposit-based services (Orlow, Radecki, and Wenninger 1996). To the extent this is the case, then the creation of extensive branch networks could impose a significant cost structure on banking organizations. This need not result in reduced profitability, however, if there are economies of scale in the operation of branch networks or if the revenue-generating performance of branches is otherwise enhanced when they are part of large branch networks.

This paper addresses the implications of recent developments in branch banking by examining a series of simple branch performance measures for a large sample of U.S. banking organizations. Ideally,

we would like to examine both the costs of operating branch networks and the revenues generated through this business to assess the profit and cost efficiency of branch networks of different sizes. Unfortunately, such data are not readily available. Instead, we identify a series of institution-level proxy variables that we argue are correlated with branch performance and ask how these measure vary, on average, across institutions with different branch network sizes. The variables examined are bank-average deposits and small business loans per branch and average deposit interest costs and deposit-related fees. Finally, we also examine the impact of branch network size on overall profitability for the institutions in our sample.

Our key findings are that, after controlling for a variety of institution-specific and market-specific factors, banking organizations with mid-sized branch networks – those containing 101 to 500 branches – had lower deposits per branch and roughly equal volumes of small business loans per branch relative to banks with larger branch networks. However, net deposit cost – defined as interest paid minus fees received – did not differ significantly between these two sets of institutions, suggesting that the better deposit-taking performance of the larger branch networks was accomplished without generating higher deposit costs. Relative to banks with 100 or fewer branches, those with mid-sized branch networks had lower deposits and small business loans per branch, but also paid lower net deposit costs. Whatever differences in these branch-related performance measures, however, there is no systematic relationship between branch network size and overall institutional profitability.

These results hold for the most recent data and also back through the mid-1990s, when the number of branches in the U.S. banking system began to increase. Thus, recent technological developments such as internet banking seem not to have altered the basic relationship between branch network size and performance. The one exception to this finding involves deposit interest costs, which appear to be systematically lower for banking organizations with larger branch networks during the mid- to late-1990s.

Overall, these findings are consistent with recent trends in branch activity suggesting that banking organizations with mid-sized branch networks may face pressure to increase branch network size. In particular, institutions with mid-sized branch networks appear to have been pursuing more aggressive

expansion of their branch networks than organizations with the largest branch networks (Hirtle and Metli 2004).

The remainder of this paper is organized as follows. The next section presents an overview of recent trends in U.S. bank branching, as well as a review of previous research on bank branch performance. Section III describes the data used in this paper and presents descriptive statistics. Section IV contains the main empirical analysis, consisting of cross-sectional regressions of the proxy branch performance measures on variables intended to capture institution-specific factors and branch market characteristics, as well as branch network characteristics. Section V repeats the analysis going back through the mid-1990s to gauge whether the effects we measure using recent data seem to be stable over time. Finally, Section VI contains summary and conclusions.

II. Recent Trends in U.S. Bank Branching

Bricks-and-mortar branches were once the only way banks and thrifts could attract and retain customers. But both technological innovation and regulatory changes in the 1990s challenged this standard delivery model. On the technological front, banks developed alternative distribution channels such as ATMs and call centers to handle both product and service origination and on-going customer service needs. The Internet boom encouraged banks to offer customers electronic access to their accounts and to conduct transactions remotely, and Internet banks, with no physical offices, appeared to offer an alternative, low-cost model for providing banking services. After the 1994 passage of Riegle-Neal Act, banks were allowed to branch and merge across state lines – contributing to an era of bank consolidation that focused on reducing costs to boost profits. As a result, the number of U.S. banks and thrifts decreased from nearly 13,000 in 1994 to just under 9,000 as of the end of 2004 (FDIC 2004).

However, even in the face of these pressures, the number of branches of FDIC-insured banks and thrifts has actually risen fairly steadily since the early 1990s (Figure 1). After the late 1980s banking crisis and the 1990-91 recession, banking and thrift organizations began to increase their branch networks. Between 1993 and 2004, the number of U.S. bank and thrift branches increased by 12 percent, to more than 90,000, with total offices exceeding their peak number for the mid-1980s (FDIC 2004).

The overall growth of the number of branches has been accompanied by a change in the distribution across banking organizations. As illustrated in Figure 2, consistent with broader trends in the U.S. banking industry, branches have becoming increasingly consolidated into the largest branch networks during the past decade. In 1994, bank and thrift organizations with more than 100 branches held 53 percent of the country's deposits and 46 percent of branches. By the middle of 2003, those figures had risen to 61 percent of deposits and 51 percent of branches. However, the most marked change has occurred at organizations with the very largest branch networks, those with more than 1,000 branches. These organizations held just under 20,000 branches in June 2003, a sharp increase from the 9,200 branches held in such networks in 1994. These very large branch networks now hold nearly 25 percent of all U.S. bank branches, as compared to less than 12 percent in 1994 (Hirtle and Metli 2004).[1]

The trend towards consolidation of branches in very large branch networks has implications for both bank customers and the banks themselves. Consumers and small businesses are the customer segments that have traditionally relied most heavily on branches to access bank services. Prior research suggests that these customers face something of a trade-off in light of the growth of very large branch networks. On the one hand, larger banking organizations and organizations that operate in multiple markets tend to charge higher fees and offer lower deposit rates than smaller, single-market institutions (Hannan 2002, 2004; Hannan and Prager 2004a, 2004b; Park and Pennacchi 2004), suggesting that branch-dependent customers could face additional costs as branches are increasingly consolidated into the large branch networks of multi-market banking organizations.

On the other hand, large branch networks offer the convenience of many possible points of contact with the institution and, potentially, the ability to avoid ATM surcharges and other usage fees by staying within the bank's own network. Prior research suggests that depositors value geographic reach

[1] Note that the total number of branches reflected in Figure 2 is somewhat smaller than that in Figure 1. The data in Figure 2 are derived from the FDIC Summary of Deposit data, which contain descriptive information that allows us to limit the sample to full-service branches. In contrast, the data in Figure 1 are the historical data reported in the FDIC's Historical Statistics on Banking, which include some limited service branches and non-deposit-taking offices. We report the data in Figure 1 because a longer historical time series is available. Over the period covered by both data sets, the trends in the data are quite similar.

(having branches in many states and municipalities) and local branch density (having many branches of an institution in a given area) when selecting a depository institution (Dick 2003). Market surveys also suggest that customers place a premium on convenience when choosing their bank – 39 percent of bank customers surveyed in 2001 indicated that they selected their bank primarily due to its location (Fung 2001). These factors imply that the scope and scale of large branch network are qualities that many customers value.

From the perspective of the institutions themselves, the growth in the number of bank branches and the consolidation of branches within very large branch networks has implications for cost structure, business focus, and profitability. Full service branches impose significant costs that banks must cover through the revenues generated by these networks, primarily the implicit and explicit income associated with deposit accounts (Orlow, Radecki and Wenninger 1996)[2]. Continued expansion of branch networks seems consistent with a belief by these organizations that branches will continue to be an effective channel for generating retail banking revenues, despite these costs and the development of alternative distribution channels such as call centers, ATMs, and online banking.

Two strands of prior research have addressed questions related to these issues. The first strand assesses the impact of the growth of multi-market banking organizations on competition in local banking markets. These papers examine the impact of large, multi-market banking organizations on the deposit rates offered by smaller, single-market banks in local banking markets. The general finding is that large, multi-market banks offer lower deposit rates than smaller, single-market banks and that the rates offered by single-market banks decline as the market share of large, multi-market banks increases (Hannan and Prager 2004a, 2004b; Park and Pennacchi 2004). The explanation is that large, multi-market banks have access to less expensive wholesale funding sources and thus are less likely to compete for retail deposits as a source of funds. In support of this contention, Hannan and Prager (2004b) find that within the set of

[2] Implicit income is derived from deposits that are priced below the market rates for alternative sources of funding, such as Fed funds or other forms of wholesale funding. Explicit revenues include fees and other revenues derived from transactions associated with deposit accounts. Radecki (1999) suggests that these two sources of revenue account for about 30 percent of operating revenues for large bank holding companies.

large, multi-market banking companies, those belonging to larger holding companies and those that operate in more states offer lower deposit rates. Pennacchi and Park (2004) further find that consumer loan rates also fall with increased multi-market bank share, suggesting a tradeoff between the welfare of borrowers and depositors as multi-market banks become more prevalent.

The implicit focus of these papers is on the competitive environment facing back customers, rather than on the performance of the banks themselves. Berger et al. (2005) do address institutional performance issues and find that the profits of small, single-market banks are lower when the market share of large, multi-market banks is greater and that this impact has increased over the period during which the large branch networks were being formed. However, they do not look at the profits of the large, multi-market banks directly, nor do they assess the impact of branch network size explicitly. In fact, although all of these papers use branch location to define multi-market versus single-market banks, none directly consider the size of the branch network as a determinant of performance.[3]

The second strand of related research is more closely tied to the institutional performance questions addressed in this paper. This research examines the impact of branch banking by assessing the cost efficiency of individual bank branches held within a branch network. In general, these studies have found increasing returns to scale for individual bank branches (see, for instance, Athanassopoulos 1998, Berger et al. 1997, and Zardkoohi and Kolari 1994, and the references therein). These findings are consistent with the idea that banks "over branch" in the sense that the individual branches are smaller than would be justified purely on the grounds of cost efficiency. Berger et al. (1997) argue that this apparent inefficiency may relate to the desire by banking organizations to provide convenience to customers, suggesting that while large branch networks may be inefficient from the perspective of minimizing costs, they may be effective at generating revenue.

[3] Cohen and Mazzeo (2004) examine the branching decisions of three groups of depository institutions – multi-market commercial banks, single-market commercial banks, and thrifts – and finds that are all three types of institution tend to have more branches in a given local market when the market share of multi-market banks is higher. Their interpretation is that the institutions are competing on "quality" by offering denser local branch networks. However, their work does not examine the impact of the institution-wide branch network size.

Fewer studies have looked at the impact of overall branch network size on efficiency or profitability, largely due to the lack of detailed branch data across a large number of institutions. Zardkoohi and Kolari (1994) examine branch networks in Finland and find that branch-level efficiency increases with the number of branches in a network, but that this effect levels off at a relatively small network size (5 branches). Hensel (2003) finds that larger European banks are less likely to realize additional cost efficiencies from expanding their branch networks than smaller institutions. Seale (2004) finds that among U.S. commercial banks, branching is associated with higher profitability, lower expenses, and higher fee income, but his analysis primarily examines distinctions among institutions with fewer than 30 branches, rather than among institutions with the large branch networks that are the focus on this paper.

With the exception of Seale (2004), most of the previous studies of branch efficiency have focused on data from the 1980s to mid-1990s and thus do not reflect the recent technological and regulatory changes that have affected branch banking. The analysis in this paper is complementary to these prior studies in that we examine a large number of U.S. banking organizations using recent data on branch network structure and institutional performance. These data allow us to make assessments of the relative performance of branch networks across the network size spectrum and to ask how other network characteristics – such as geographic scope and local branch density – affect performance. We can also distinguish between branch network size and overall institution size using these data. The trade-off is that the data provide information primarily at the institution-level, so our analysis is limited to assessing average branch performance in a very general framework, rather than being able to do the detailed efficiency analysis of many of the previous studies.

III. Data and Empirical Approach

The data used in this paper are derived from bank and thrift regulatory reports, which provide coverage of a wide scope of institutions. Specifically, the FDIC Summary of Deposit data contain information about the location, ownership, and deposit amounts booked at all offices of FDIC-insured

bank and thrift institutions.[4] We aggregate these branch-level data to the highest U.S. bank holding company level to form the branch network for each institution as of June 2003.[5] Branch network size is defined as the number of full service, permanent branches held by the organization, including both stand-alone and in-store ("supermarket") branches. We also use data on branch location to construct variables intended to capture the geographic scope and density of each branch network.

We then link the branch network data to income and balance sheet data for the banks and thrifts in the organization. In particular, we identify all commercial banks and thrifts held in each organization and aggregate data from the Call Reports (for commercial banks) and the Thrift Financial Report (for thrifts) to construct aggregate performance measures and control variables. Because we are primarily interested in the performance of banks operating significant branch networks – as opposed to unit banks or small community banks – we eliminate all organizations with ten or fewer branches. Within each organization, we also drop special-purpose processing or credit-card banks whose activities are not retail in nature.[6] This process creates a sample of 682 bank and thrift organizations with more than ten branches as of June 30, 2003.[7] For the 270 of these institutions that have publicly traded equity, we also link stock return data from the Center for Research in Security Prices (CRSP).

Table 1 provides a breakdown of the sample by branch network size. Most of the institutions in the sample – 557 of 682 – fall into the smallest branch network size category, with between 11 and 50 branches. Twenty institutions hold more than 500 branches, with the largest network composed of more than 4,000 branches. The average branch network size is 77 branches, though reflecting the distribution of the sample, the median is much smaller, at 18 branches.

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[4] These data are available at <http://www2.fdic.gov/sod/index.asp>.

[5] In some cases, the highest holder is a stand-alone bank that is not part of a holding company. In the case of foreign-owned institutions, the high holder is the highest U.S. holding company in the institution's structure, combining U.S. high holders owned by the same foreign parent.

[6] In particular, we drop credit card banks (defined as any bank with credit card loans plus securitized receivables exceeding 50 percent of assets or with credit card loans exceeding 80 percent of loans), banks or thrifts holding no loans on the balance sheet, and banks and thrifts where small time plus savings deposits equal less than 5 percent of transaction deposits.

[7] In addition to the 682 institutions in our sample, we identified 1,989 unit branch institutions and 3,812 institutions with 2 to 10 branches.

Ideally, for each institution, we would like to be able to capture both the revenue generated by these branch networks as well as the costs associated with operating them. Unfortunately, the Call Reports and Thrift Financial Reports provide information only at the institution level, which does not permit us to isolate branch network operations cleanly. Instead, we develop a series of proxy measures of performance and cost that we argue are likely to be correlated with branch network performance. In particular, one of the key functions of a branch network is to collect deposits; all else equal, the higher the level of deposits held at a branch, the more profitable the branch, as the fixed costs of branch operation can be spread across a wider deposit base (see Orlow, Radecki and Wenninger 1996). Research also indicates that, controlling for other characteristics of the transaction, higher levels of deposits are associated with higher premiums in branch sales (Edelstein and Morgan 2004), consistent with the idea that deposits are a meaningful measure of branch performance.

Thus, we calculate several measures intended to capture average deposits per branch. The first of these is total domestic deposits per branch, calculated as the total domestic deposits held by each organization divided by the total number of branches. This basic measure may present a biased picture of the performance of the branch network in collecting deposits across the branch network size spectrum, however. To the extent that larger institutions have wholesale or brokered deposits that are not collected through the branch network, the total deposit variable may over-state branch network performance for larger institutions.

To control for this effect, we construct several other deposit-based measures. In the first of these, we use the Summary of Deposits data to identify the "head office" for each bank and thrift in our sample and recalculate deposits per branch removing head offices that appear to have large volumes of non-retail deposits.[8] In the second measure, we use Call Report and Thrift Regulatory Report data to create a "core

[8] We cannot identify which deposits at any particular branch are retail in nature and which might be wholesale or related to national businesses not tied to the branch network. However, many large banking organizations have one or more branches with significantly larger volumes of deposits than the rest of the branch network. These branches seem most likely to be the ones where non-retail deposits are booked. To identify these in a systematic way, we examined all bank holding companies with more than 100 branches and sorted the branches for each bank and thrift in the organization by deposit volume. Then, going subsidiary by subsidiary within the holding company, we

deposits" variable by removing all time deposits greater than $100 thousand. In the final measure, we remove brokered deposits to create non-brokered deposits per branch.

Aside from collecting deposits, branch networks also generate new lending, especially consumer and small business lending. While at many larger banking organizations, credit decisions have been removed from the branch and centralized in regional or national credit offices, branches arguably continue to serve as an initial point of contact for new consumer and small business customers. Thus, one measure of productivity for a branch network is the volume of new retail lending generated through these contacts. Unfortunately, we cannot measure this flow directly from the available regulatory report data. Instead, as a proxy measure, we calculate the volume of small business lending per branch. We focus on small business loans rather than consumer credit because for many large institutions, consumer credit such as credit cards and mortgages are national businesses run outside of the branch network. Using institution-aggregate data for these loans would be extremely misleading. While small business lending may suffer somewhat from the same bias, we believe that it is likely to be more closely tied to the branch network.[9]

The variables we consider are total small business loans per branch, where small business loans are defined as loans to commercial and industrial borrowers (including those secured by nonresidential real estate) with original amounts of $1 million or less. We also break out two sub-categories of small business lending: "small" small business loans per branch, defined as loans with original principal

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looked at branches with $1 billion or more in deposits. Starting with the smallest of these, we flagged a branch if it held 15 percent or more of the subsidiary's overall deposits or if its deposits were more than twice the amount of the next smallest branch in the subsidiary. We then dropped the flagged branch and any branches larger than the flagged branch. In addition, we dropped any branch holding more than $5 billion in deposits. Altogether, we dropped 108 branches held by 56 bank holding companies (of more than 38,000 branches held by the 77 holding companies in our sample with more than 100 branches). Most institutions had only one branch dropped; the maximum number dropped was six. On average, these branches held about $7 billion in deposits. We tried several variants of this approach, including a branch-by-branch review of large branches; the regression results reported below are not sensitive to the particular method we use to identify "head office" branches.

[9] Working with data from the Federal Reserve's 1993 National Survey of Small Business Finance, Petersen and Rajan (2002) find that the median distance between a small business and its lender is 9 miles and that 75 percent of firms borrow from a financial institution within 42 miles, suggesting that for many small firms, borrowing occurs locally. That said, the study is based on 1993 data and the key finding is that the lender-borrower distance has increased over time, so the link between local branch location and small business lending origination may have weakened further in the years between the Survey data and the data used in this study.

amounts of $250,000 or less, and "large" small business loans per branch, defined as loans with original principal amounts between $250,000 and $1 million.

Our final proxy measures capture a key aspect of branch network costs, interest payments on deposits. Ideally, we would like measures that capture the full cost of operating branch networks, including real estate, technology, and salary and other personnel costs. Once again, the regulatory reports do not break out this information for branch network operations. However, we can develop measures of deposit interest expense from the income statements in the Call Reports and Thrift Financial Reports.

In particular, we estimate average deposit interest costs by dividing annualized deposit interest payments for the third quarter of 2003 by quarterly-average total domestic deposits. This measure captures the overall interest cost associated with deposits, including those deposits on which no interest is paid. As an additional measure, we also calculate interest costs relative to interest-bearing deposits, to capture the average rate on those deposits where interest is paid.[10] We use interest costs in the quarter following the date of the branch network data to minimize the possibility of simultaneity bias, though we lose some observations due to mergers during this quarter, particularly among the larger institutions.

The data also allow us to examine the deposit-related fees earned by commercial banks. These fees include, for instance, fees on low-balance accounts, returned check fees, and fees for services such as stopping checks or drawing certified checks. To the extent that banks present retail depositors with a schedule of deposit-related prices that involves both interest paid and fees charged, examining interest payments in isolation could misrepresent the relationship between deposit expenses and branch network size. Thus, we also examine calculate average deposit fees earned per dollar of deposits and net deposit

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[10] The interest cost variable for interest-bearing deposits captures interest expense and deposits outstanding just for the commercial bank subsidiaries of the holding companies in our sample. Comparable breakouts of interest expense are not available on the Thrift Financial Reports so it was not possible to include information for thrift subsidiaries.

interest cost, which is defined as interest paid on deposits minus fees earned, divided by average deposits.[11]

Summary statistics for the proxy performance and cost variables are presented in Table 2A.

Given the lack of branch-network-specific performance and cost data, our empirical approach is to do simple regression analysis of these performance and cost proxies on a series of variables intended to capture the characteristics of the bank and the geographic markets in which it operates branches, as well as characteristics of the branch network itself. We then ask how branch network size appears to affect the performance and cost proxies, controlling for these other factors.

Summary statistics for these control variables are presented in Table 2B. The variables intended to capture characteristics of the institution include asset size, the total risk-based capital ratio, and the loan-to-asset ratio. To create variables that more closely track the branch-related activity of the holding company, we calculate these institution-level financial variables as aggregates of the commercial bank and thrift subsidiary values, rather than from consolidated holding company data. As a rough control for the impact of recent merger activity, we also include the ratio of all banking or thrift assets acquired through mergers in the two years prior to our observation point (June 2001 to June 2003) to end-of-period banking and thrift assets. Finally, we include the number of bank and thrift subsidiaries in the holding company as a proxy measure for institutional complexity.

The institutions in the sample range between $100 million and nearly $700 billion in assets. Because the relationship between asset size and branch performance may be non-linear, in the regressions the impact of asset size is captured using dummy variables for different size categories (less than $500 million, $500 million to $1 billion, $1 billion to $10 billion, and more than $10 billion). Slightly over half the sample institutions have less than $1 billion in assets – the median value is about $850 million – while about 10 percent fall into the largest size cohort (more than $10 billion).

[11] Since data on deposit fees are available for commercial banks but not for thrifts, net deposit interest cost is calculated only for the commercial bank subsidiaries of each bank holding company.

We control for several variables intended to capture the characteristics of the markets in which the bank operates branches and of the branch network itself. In particular, to capture differences in economic activity in the markets in which each organization operates, we include average state-level personal income growth in the two years prior to our observation point, where the state-level figures are weighted by the share of branches held by the organization in each state in which it operates. To capture differences in market competition, we include the average deposit-based Herfindahl-Hirschmann Index (HHI) in the MSAs in which the institution operates, weighted by the share of the organization's branches in each MSA.[12] To reflect the geographic scope and local density of the branch network, we include the number of states and number of MSAs and non-MSA counties in which each organization holds branches and the weighted average branches-per-capita at the MSA level, where the share of the network's branches in each MSA is used as the weight. Finally, we include a control for the share of branches in supermarkets and other retail outlets ("in-store branches") since these branches may operate on a different scale than stand-alone offices.

Our key measures are a series of dummy variables for branch network size groups. In particular, we separate the observations into branch networks with 11 to 50 branches, 51 to 100 branches, 101 to 500 branches, 501 to 1000 branches, and more than 1000 branches (see Table 1). In the regression, we will test to see how the performance and cost proxies vary on average across these branch network size groups, controlling for the institution- and market-specific variables described above.

IV. Empirical Results

As a first step in assessing the impact of branch network size on our proxy performance and cost variables, we do a simple comparison of means and medians across the branch network size groups. These results are presented in Table 3. Looking first at the deposit variables, deposits per branch increase as the size of branch network grows, from an average of about $40 million per branch for networks with

[12] The HHI is calculated as the sum of the square of the market share of each participant in a geographic market. In our case, the relevant market share is based on deposits held by each organization, and the geographic market is defined either as an MSA or non-MSA county. The HHI runs between 0 for a market with an infinite number of competitors to 1.0 for a market with a single competitor.

11 to 50 branches to an average of $70 to $90 million for the largest branch networks. While mean deposits per branch are higher for networks with 501 to 1000 branches than for the largest network size group, this difference is not statistically significant. In contrast, the median values (in parentheses in the table) grow uniformly across the branch network size groups. The pattern is similar across the other deposit variables.[13]

A different pattern emerges for the small business loan variables, with average and median tending to decline with the size of the branch network, though this decrease is not monotonic. Average total small business loans per branch range from about $7.6 million for the smaller branch networks to $5.6 million for networks with more than 1000 branches. However, the differences across branch network size groups are only marginally statistically significant for the average values and not statistically significant for the medians.

Finally, both the means and medians of the deposit interest cost variables tend to decline with branch network size, suggesting that banks with largest branch networks tend to pay lower deposits interest rates. Average interest cost on total deposits averaged 1.46 percent for banking institutions with the smallest branch networks, as compared to 0.88 percent for institutions with more than 1000 branches. The median values decline by a similar amount. The pattern is nearly identical for interest costs on interest-bearing deposits.

In contrast, average deposit fees increase with branch network size, from an average of about 60 basis points for institutions with small branch networks to 90 basis points for institutions with the largest branch networks. Taken together, the patterns for interest cost and deposit fees translate into sharply lower net deposit cost for institutions with large branch networks. Net deposit cost averages 85 basis points for institutions with 11 to 50 branches, as compared to a negative 4 basis points for institutions

[13] The hypotheses that the means/medians of the deposit variables are the same across the branch network size groups can be rejected at high confidence levels. The hypothesis that the means are the same for the two largest network size groups – 501 to 1000 branches and more than 1000 branches – cannot be rejected, however.

with more than 1000 branches. The differences in both means and medians across branch network size groups are statistically significant at high confidence levels.

The results in Table 3, while indicative, do not take other potentially important influences on branch performance into account. Table 4 presents the results of cross-sectional regressions that control for the institution- and market-specific factors described in the previous section. The first page of the table (Table 4A) presents the results for the deposits-per-branch variables, the second page (Table 4B) presents the results for the small business loan variables, while the third page (Table 4C) presents results for deposit interest costs. All regressions are estimated using robust standard errors. To reduce the impact of outlier observations, we drop a small number of institutions that report negative interest cost or deposit fee income or whose reported deposit fee income exceeds 5 percent of deposits.

Turning first to the results for average deposits per branch, we find consistent results across the alternative deposit measures. Of the variables included to control for institution-specific factors (asset size dummies, the total capital ratio, the loans-to-assets ratio, the share of assets acquired in recent mergers, and the number of entities), only asset size consistently appears to influence the average volume of deposits per branch. Deposits per branch increase significantly across the asset size groups; the hypothesis that the coefficients on the asset size dummy variables are equal to zero can be rejected at high confidence levels. Deposits-per-branch also appear to be positively correlated with the number of bank and thrift entities in the holding company and negatively correlated with the amount of assets recently acquired through mergers, though these variables are not statistically significant for most deposit types.

Of the variables intended to capture characteristics of the markets in which each organization operates branches, state personal income growth – intended to reflect economic conditions in the banks' service areas – enters with a negative coefficient, though it is not statistically significant in all specifications. Market concentration – as measured by the weighted average HHI in the MSAs where the institution holds branches – does not have a significant impact on deposit levels.

Turning now to the variables capturing characteristics of the branch network, those reflecting the geographic scope of the branch network – number of states and number of MSAs in which each

institution holds branches – both enter the regressions significantly, but with opposite signs. Operating in more states is associated with higher per-branch deposit volumes, while the opposite is true at the MSA level. Higher network density in local markets is associated with lower deposits-per-branch, a finding consistent with the "over-branching" result in Berger et al. (1997). Finally, the coefficient on the variable reflecting the share of supermarket (in-store) branches in the network is consistently negative and statistically significant, most likely reflecting the smaller scale of in-store branches as compared to stand-alone branches.

The key variables of interest in our estimation specification are the dummy variables reflecting branch network size. These variables are jointly significant in each of the deposit equations (see the last row of the table), with a generally similar U-shaped pattern. In particular, the estimates suggest that institutions with between 101 and 500 branches (the omitted branch network size category in the regression) tend to have lower deposits per branch, all else equal, than institutions at both the lower and upper end of the branch network size spectrum. The network size coefficients are individually statistically significant for the smaller size categories and are significant for the very largest branch network size group, though at somewhat lower confidence levels. The estimates imply that, all else equal, average deposits per branch are $20 to $45 million higher at banks at the upper and lower ends of the branch network size spectrum than at banks with mid-sized branch networks.

Thus, controlling for other institution- and market-specific factors appears to alter the implied relationship between branch network size and branch deposit-holding performance that appeared in the raw data presented in Table 3. Finer analysis of the data indicate that the key factor in this change is including asset size as a control variable. Branch network size and institution asset size are correlated, and it appears that much of the apparent positive relationship between deposits per branch and branch network size in Table 3 is really an artifact of asset size. If the asset size control variables are omitted from the regression, then the U-shaped pattern over branch network size cohorts is considerably damped, with only the very largest branch network size group having deposits per branch significantly higher than the 101-to-500 branch cohort.

The next set of results involves the small business loan proxy variables (Table 4B). The impact of many of the institution-specific and market-specific control variables are similar to those in the regressions with the deposit-based performance proxies. In particular, the coefficients on the asset size dummy variables and the number of entities variable have similar signs and are generally statistically significant in both sets of equations. The key differences are that the variables describing branch network geographic scope are not significant in the small business loan equations, while the coefficient on the institution's overall loans-to-assets ratio is, perhaps not surprisingly, positive and significant.

Once again, the key variables of interest are the branch network size dummies. In each equation, the hypothesis that average small business loans per branch are the same across branch network size groups can be strongly rejected (see the last row of the table). However, there are noticeable differences across the different small business lending variables in the pattern of coefficients across the network size groups. For total small business loans, the coefficients suggest that, all else equal, average small business loans per branch tend to be higher for institutions with 100 or fewer branches than for institutions at the larger end of the branch network size range. While the coefficients decline monotonically as branch network size increases, we cannot reject the hypothesis that average small business loans per branch are the same for the three largest size categories.

The pattern for total small business loans appears to be driven by the larger of these loans, those with principal amounts greater than $250,000. The results for these "large" small business loans (the third column of Table 4B) are very similar to those for the overall small business loan amounts. In contrast, the results for "small" small business loans show a U-shaped pattern, with institutions with 101 to 500 branches having smaller volumes of loans per branch than institutions at either end of the branch network size range. However, these differences are statistically significant only for the small branch network size groups.

The final set of variables we examine is average deposit interest costs. These results are reported in Table 4C. The first two columns of the table contain the results for the interest expense categories: interest expense on all deposits and on interest-bearing deposits. While the basic data presented in Table

3 suggest that the average deposit interest costs tend to decline with branch network size, the results in these columns indicate that once other control variables are included, this pattern is considerably damped. Deposit interest cost is significantly greater for institutions in the smallest branch network size cohort than for institutions with 101 to 500 branches, but there is no significant difference for the other branch network size groups. Overall, the hypothesis that the coefficients on the branch network size dummy variables are equal to zero cannot be rejected (see the last row of the table).

Once again, the asset size dummy variables appear to account for this outcome. The coefficients on these variables indicate larger institutions tend to face lower average deposit interest costs: institutions in the largest asset size category (over $10 billion) have average deposit interest expenses that average 40 to 45 basis points less than those of the smallest institutions (those with assets under $500 million), all else equal.

The results for the other control variables indicate that average deposit interest costs tend to be lower for banks with higher total capital ratios and higher for banks with higher loan-to-asset ratios, that have recently acquired assets through mergers, and with more bank and thrift entities in the holding company. Institutions operating in markets with higher income growth and with higher branch network density in local markets also tend to have higher average deposit interest expenses.

Interest paid on deposit accounts may not fully capture differences in deposit costs across institutions, however. Banks also earn fee income from deposit accounts and associated transactions and may trade off interest paid on accounts against fees charged. The third and fourth columns of Table 4C report regression results using average fee income and net deposit cost – deposit interest expense minus deposit fee income – as the dependent variable. The fee income results suggest that fee income per dollar of deposits rises with branch network size, with institutions in the smallest branch network size category having fee income about 35 basis points lower than institutions in the 101-to-500 branch size group, and about 40 basis points lower than institutions in the largest branch network size category. However, the results suggest that while fee income differs between institutions with 100 or fewer branches and those

with more, there are no significant differences in fee income among institutions with more than 100 branches.

Together with the results for overall deposit expense, the fee income results translate into higher net deposit interest costs for institutions with smaller branch networks. Institutions with 100 or fewer branches had net deposit costs that were 40 to 50 basis points higher than banks with more than 100 branches. As with the fee income results and in sharp contrast to the unconditional results presented in Table 3, there were no significant differences in net deposit costs among institutions with more than 100 branches.

Taken together, the results discussed above suggest that banking organizations with mid-sized branch networks – those with 101 to 500 branches – may face competitive pressure, especially from institutions with larger branch networks. These mid-sized networks tend to have lower deposits per branch than institutions at the upper and lower ends of the branch network size range. These institutions also have tend to have lower volumes of small business loans per branch relative to the smaller branch networks. At the same time, once institution- and market-specific factors – especially asset size – are taken into account, institutions with mid-sized branch networks face net deposit costs that are higher than those for institutions with smaller branch networks (100 or fewer branches), but comparable to those for institutions with larger branch networks. These results paint a mixed picture of performance relative to institutions with smaller branch networks, since these smaller networks have both higher performance measures (deposits and small business loan per branch) but also higher net deposit costs. Relative to bigger branch networks, however, the results suggest that that performance differences may not be offset through lower deposit expenses.

Of course, given our simple estimation framework, the results are suggestive rather than definitive. We are not able to measure the revenue generated by the branch networks, nor the full range of associated costs. And to a large extent, examining branch network operations in isolation from the rest of the banking organization may ignore important cross-effects that could impact branch network performance. There could, for instance, be technological scope economies in the design, implementation,

and operation of branch network information processing systems with systems in other parts of the banking organization, or revenue generated for other business lines through cross-selling (e.g., insurance sales or mutual fund sales or asset management accounts). On the other side of the ledger, very large and diverse organizations could suffer managerial inefficiencies that could detract from the operating performance of the branch network.

Nonetheless, our results are consistent with some of observed behavior of retail banking organizations in recent years. Organizations with smaller and mid-sized branch networks have grown faster and devoted much more of their overall branch activity (acquisition of new branches through purchase or de novo opening and divestiture through sales and closings) to expansion than institutions with larger branch networks (Hirtle and Metli 2004). For instance, the median increase in branch network size between June 2001 and June 2003 was 4 to 5 percent for networks with 100 to 500 branches, as compared to a median decline in branch network size for larger networks. These trends are consistent with the idea these institutions were adopting a branch network growth strategy, perhaps in light of the kinds of performance and cost issues illustrated in our regression results. More generally, the overall trend towards consolidation of U.S. bank and thrift branches within the very largest branch networks and away from mid-sized networks (see Figure 1) is consistent with these findings.

We do one final exercise to try and assess the all-in impact of branch network size on performance. Specifically, we repeat the regression estimation using three measures of institution-wide profitability as the dependent variable. The first measure is accounting-based return on equity (ROE), calculated as the ratio of annualize net income in Q3 2003 to book equity as of June 2003. The second measure is the market return on the bank holding company's publicly traded equity, calculated as the average of weekly returns during Q3 2003. The third measure is a risk-adjusted return, calculated by dividing the market return by the standard deviation of weekly returns during the quarter (the "Sharpe Ratio"). Since it is based on regulatory report data, ROE is available for nearly all observations in the sample, but the market-based measures are available only for a sub-set of 270 firms with publicly traded

stock.[14] Descriptive statistics of the ROE, market return, and risk-adjusted market return variables are reported in Table 2A.

These profitability variables are at best noisy measures of branch performance, since they reflect all activities of the institution, not just those related to the branch network. To lessen this impact, we estimate an augmented specification including several additional control variables intended to capture the effect of other factors on institution-level profitability. These include the ratio of nonperforming loans to total loans, the ratio of non-interest income to operating income (non-interest income plus net interest income), the ratio of trading assets to total assets, and ratio of retail-related loans to total loans, where retail-related loans are defined as the sum of credit card loans and other revolving credit, consumer loans, 1 to 4 family mortgages, and home equity loans.

The results for the profitability regressions are reported in Table 5. The first columns of the table present results of the basic specification, while the right-hand columns present results for the augmented specification including the additional control variables. The overall results concerning the association between branch network size and institutional profitability do not differ meaningfully between the two specifications. They do differ meaningfully, however, between the measures of profitability. The accounting-based ROE results suggest that profitability increases with branch network size, while the market-based measures suggest the opposite. The ROE results are quite similar to those reported in the table when the sample is limited to the observations for which stock market data are available, so these differences are not driven by differences in the sample. Overall, then, these results do not suggest a clear relationship between branch network size and institution-wide profitability.

V. Results for Earlier Years

As discussed above, significant regulatory and technological changes since the mid-1990s have almost certainly altered the basic cost and production considerations governing the delivery of retail

[14] As noted above, since ROE is calculated using net income from the quarter following the date of the branch data, we lose some observations due to mergers. In addition, we drop observations where the calculated ROE either exceeded 50 percent or was less than -50 percent. Altogether, about 30 observations are dropped from the sample.

banking services. One question that arises is whether the impact of branch network size on performance has evolved over time in light of these changes. In this section, we examine this question by repeating the regression analysis for annual samples from the years 1995 to 2003. The goal is to see whether the results discussed thus far – which suggest that mid-sized branch networks may be at a competitive disadvantage relative to both larger and smaller networks – are stable over time.

Using the methodology described above, we constructed samples of banking organizations with more than 10 branches for the years 1995 to 2002. Descriptive statistics for these samples are reported in Table 6. The table also contains information from the 2003 sample for comparison. The number of organizations in the sample rises steadily over the years, from 524 in 1995 to 682 in 2003. Essentially all of this increase is accounted for by the growth in the number of organization in the smallest size cohort – those with 11 to 50 branches. These organizations represent 82 percent of the sample in 2003, as compared to 75 percent in 1995. Interestingly, this increase is paralleled almost exactly by a decrease in the share of organizations in the 101-to-500 branch cohort, which falls from 14 percent to 8 percent of the sample (and from 72 to 57 institutions). These mid-sized branch networks, of course, are the cohort that the regression results for 2003 suggest may be at a competitive disadvantage.

Tables 7A to 7E present regression results for the 1995 to 2002 samples using the same specification applied to the 2003 sample. The tables also repeat the results for 2003 to make comparisons easier. For conciseness, the tables report regression results for just three representative performance variables – non-head office deposits per branch, total small business loans per branch, and net deposit costs – and for two profitability variables, return on equity and risk-adjusted market returns. The results for the other deposit, small business loan, and interest costs and deposit fee variables are substantially similar to those presented in these tables.

The results for the 1995 to 2002 samples are quite similar to those for the 2003 sample, especially for deposits per branch and small business loans per branch. Turning first to deposits per branch (Table 7A), the core results concerning the impact of branch network size are robust over the earlier samples. In each of the annual samples, we can strongly reject the hypothesis that non-head office deposits per branch

are the same across branch network size groups (see the last row of the table). The coefficient estimates produce a similar U-shaped pattern to the 2003 results, with institutions in the 101-to-500 branch cohort having lower levels of deposits per branch than both larger and smaller networks. However, for the middle part of the sample (1997 to 1999), the differences between the 101-to-500 branch cohort and the two larger cohorts are not statistically significant.

The historical results for total small business loans per branch (Table 7B) are also quite similar to those for the 2003 sample. Once again, the core results concerning the impact of branch network size are consistent across the years: for each sample year, the hypothesis that small business loans per branch are the same across branch network size cohorts is strongly rejected (see the last row of the table), with the coefficients indicating that banks with small branch networks have higher volumes of small business loans per branch than banks with more than 100 branches. As with the 2003 sample, differences between the 501-to-1000 branch group and the larger networks are not statistically significant.

Finally, the historical results for net deposit cost also reinforce the results for 2003 (Table 7C). The estimates suggest that net deposit costs vary significantly across branch network size groups, with institutions with 100 or fewer branches having higher net deposit costs and institutions with more than 1000 branches having lower net deposit costs than institutions with 101 to 500 branches. Interestingly, the difference in net deposit costs between the mid-sized branch networks and the largest branch networks appears to have decreased in both size and significance over time. The coefficients for the more-than-1000 branch cohort drop sharply after 2000, falling from levels of 100 basis points or more during the mid-to-late 1990s, to 10 to 25 basis points in the early 2000s. These results suggest that institutions with large branch networks have enjoyed less of a funding advantage than was the case earlier in the sample period.

In contrast to the branch network performance proxy results, the historical results for the profitability regressions are not consistent with the 2003 results (Tables 7D and 7E). Results for earlier years reveal no consistent relationship between branch network size and profitability. In most cases, the branch network size variables are not statistically significant and there is no clear pattern in the sign and

magnitude of the coefficient estimates over time. This (lack of) finding holds for both the accounting-based and market-based measures of profitability. Thus, the conflicting results between the accounting- and market-based measures for 2003 appear to be part of a broader set of results suggesting little systematic relationship between branch network size and overall firm profitability.

In general, the implications of the historical results are quite consistent with those from the results based on the 2003 sample. As compared to banks with the very largest branch networks, banks with mid-sized branch networks had lower deposits per branch, roughly equal volumes of small business loans per branch, but have historically had higher net deposit costs. Banks with smaller branch networks (100 or fewer branches) had higher deposits and small business loans per branch than institutions with mid-sized branch networks, but faced higher net deposit costs. The implication of these results is that mid-sized branch networks appear to be at somewhat of a competitive disadvantage, especially relative to the very largest branch networks, throughout this period. This disadvantage may have weakened somewhat in recent years, however, given the reduction in the difference in net deposit costs between institutions with mid-sized and larger branch networks.

VI. Summary and Conclusions

Despite technological and regulatory innovations that might have been expected to reduce banking institutions' reliance on bricks-and-mortar branches to deliver financial services, the number of full-service bank and thrift branches has increased steadily since the early 1990s. In addition, an increasing share of these branches is held in the very largest branch networks, those with more than 1,000 branches. While several studies have considered the impact of the expansion of large, multi-market banking organizations into local markets, relatively little analysis has taken a direct look at the impact of increasing branch network using recent branching data.

This paper takes a simple empirical approach to addressing these developments. We identify a series of performance and cost proxies and assess the impact of branch network size, after controlling for other institution-specific and market-specific factors. In particular, our results reveal that in assessing the

impact of branch network size, it is important to control for institution asset size, since the two are correlated.

Our results suggest that institutions with mid-sized branch networks have lower deposits per branch than organizations with both larger and smaller branch networks. They also hold lower levels of small business loans per branch than smaller organizations. Further, after controlling for asset size, institutions with mid-sized branch networks have no deposit expense advantage relative to institutions with larger branch networks (though lower costs than institutions with smaller networks). Taken together, these findings suggest that banks with mid-sized branch networks may face profit pressure in their branch network operations since their per-branch performance appears to lag that of both smaller and larger institutions, with no offset in deposit interest costs relative to the larger institutions. That said, the results suggest some improvement in the relative performance of mid-sized versus larger branch networks in recent years, as net deposit costs are no longer significantly smaller for institutions with the largest branch networks. There appears to be little relationship, however, between branch network size and overall firm profitability, whether measured using accounting- or market-based data.

Aside from these specific findings, the paper also makes a complementary contribution relative to prior research by distinguishing between asset size and branch network size in the empirical specification. Much of recent consolidation in the U.S. banking industry has reflected a desire by the banks in question to extend their retail branch networks. Thus, in assessing the implications of these developments, it is helpful to distinguish between asset size, which reflects the full range of activities pursued by an organization, and branch network size, which is more closely tied to retail activities. Our results suggest that there is a meaningful distinction between these two measures of institutional size, and that it may be important to control for both when assessing the impact of recent consolidation and institutional focus on retail banking activities.

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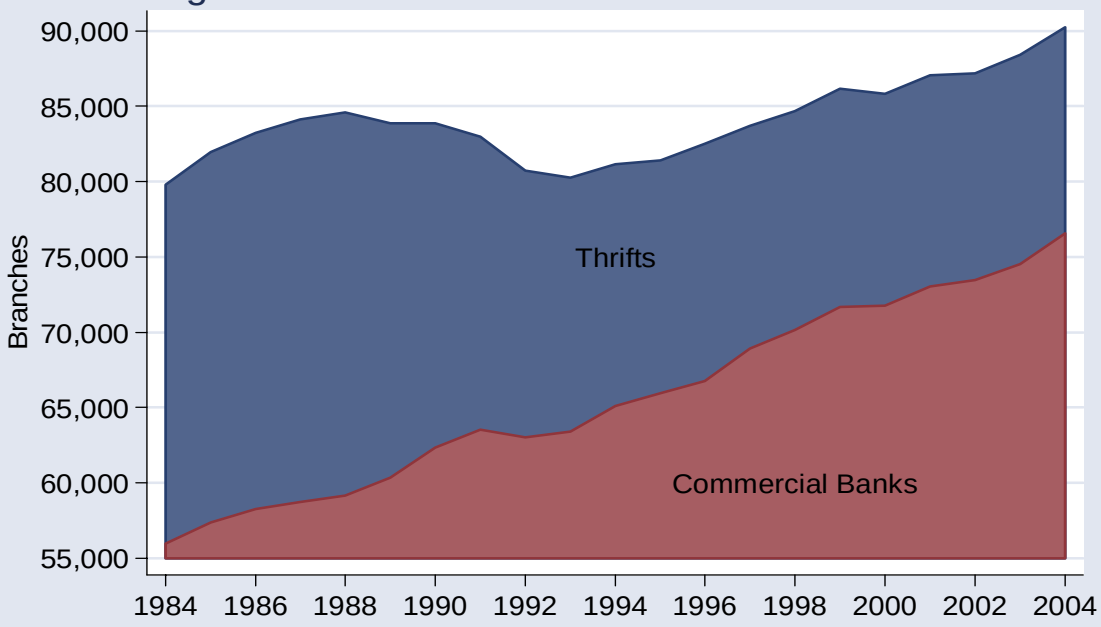
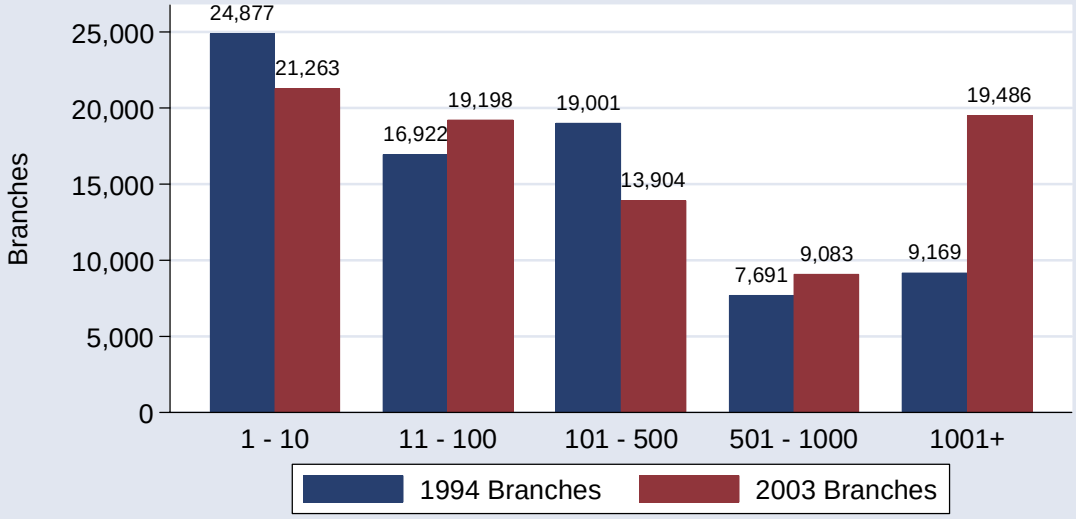
Figure 1: Offices of FDIC Insured Banks and Thrifts



Sample consists of US domiciled banks and thrifts, offices at year-end.
Source: FDIC Historical Statistics on Banking

Figure 2: Distribution of Branches by Branch Network Size



Sample consists of all full-service deposit taking offices as of mid-year.
Source: FDIC Summary of Deposits

Table 1
Distribution of Sample by Branch Network Size
June 30, 2003

Branch Network Size	Number of Organizations	Average Number of Branches	Median Number of Branches	Minimum Number of Branches	Maximum Number of Branches
11- 50	557	19.5	16	11	50
51 – 100	48	70.0	69	51	100
101 – 500	57	215.5	178	101	483
501 – 1000	11	703.3	697	521	942
1001+	9	2008.8	1701	1077	4030
Total	682	76.7	18	11	4030

Source: FDIC Summary of Deposits and authors' calculations.

Table 2A: Summary Statistics for Branch Network Performance Proxy Variables

	Mean	Median	Minimum	Maximum
Deposits per Branch:				
Total Deposits	42.5	34.0	4.0	485.0
Non-head office Deposits	38.8	33.7	4.0	265.6
Core Deposits	35.6	29.2	2.8	348.9
Non-brokered Deposits	41.4	33.5	4.0	485.0
Small Business Loans per Branch:				
Total Small Business Loans	7.4	6.6	0.0	32.6
"Small" Small Business Loans	3.0	2.8	0.0	14.3
"Large" Small Business Loans	4.4	3.6	0.0	21.6
Average Deposit Interest Cost:				
All Deposits	1.41	1.42	0.22	3.67
Interest-Bearing Deposits	1.66	1.68	0.38	4.32
Deposit Fees	0.63	0.55	0.00	2.96
Net Deposit Cost	0.77	0.77	-2.22	3.67
Profitability				
ROE	13.51	13.47	-37.94	41.13
Market Return	0.58	0.51	-1.04	3.18
Risk-Adjusted Market Return	0.32	0.29	-0.57	1.42

Deposit and small business loan data are in millions of dollars as of June 2003. Total deposits include all domestic deposits. Non-head office deposits are aggregate deposits held in all bank and thrift branches, excluding deposits held in large head offices of organizations with 100 or more branches. Core deposits are total deposits minus time deposits greater than $100,000. Non-brokered deposits are total deposits minus brokered deposits. "Small" small business loans have original principal amount of less than $250,000, while "large" small business loans have original principal amounts between $250,000 and $1 million. Deposit interest cost on all deposits is total interest expense divided by quarterly average total domestic deposits. Deposit interest cost on interest-bearing deposits is total interest expense divided by quarterly average interest-bearing domestic deposits. Deposit fees are fees on deposit accounts divided by quarterly average deposits. Net deposit cost is total deposit interest cost minus deposit fees divided by quarterly average deposits. All deposit interest expense variables are for Q3 2003, expressed at annual rates. ROE is annualized Q3 2003 net income divided by Q2 2003 equity. Market Return is the average weekly return on the BHC's public equity during Q3 2003 for the 270 BHCs with publicly traded equity. Risk-Adjusted Market Return is the average weekly stock return divided by the standard deviation of the weekly return during Q3 2003. All data come from the Reports of Condition and Income (Call Reports) for commercial bank subsidiaries and the Thrift Financial Reports for thrift subsidiaries of the holding company, with the exception of the data for non-head office deposits, which are derived from branch-level deposit data as reported on the FDIC's Summary of Deposits, and stock return data, which are from the Center for Research in Securities Prices.

Table 2B: Summary Statistics for Institution, Market, and Branch Network Variables

	Mean	Median	Minimum	Maximum
Institution Characteristics				
Total Assets	9.004	0.843	0.098	662.2
Total Capital Ratio	0.132	0.124	0.085	0.455
Loans to Assets Ratio	0.648	0.661	0.183	0.913
Assets Acquired via Merger over Assets	0.058	0.000	0.000	0.903
Number of Entities	2.23	1	1	40
Market Characteristics				
Weighted Average State Personal Income Growth	0.058	0.059	0.015	0.103
Weighted Average HHI, MSA level	0.1831	0.1706	0.0513	0.5709
Branch Network Characteristics				
Number of States	1.98	1	1	24
Number of MSAs	12.96	6	1	439
Branches per capita, MSA level	0.053	0.041	0.001	.345
In-store Share	0.044	0.000	0.000	.729

Notes: All data are as of June 2003. Total assets is in billions of dollars. Total capital, loans to assets, assets acquired via merger, and state personal income growth are ratios. The financial variables (total assets, total capital ratio, and the loans-to-assets ratio) are constructed from data from the Reports of Condition and Income (Call Reports) for the banks and from the Thrift Financial Reports for the thrifts in each holding company. Number of entities equals the number of bank and thrifts held by the bank holding company. HHI variable is expressed from 0 to 1. Branches per capita variables are branches per thousand people. In-store share is the share of retail ("supermarket") branches.

Table 3: Proxy Variables by Branch Network Size Group

	Branch Network Size				
	11 to 50 branches	**51 to 100 branches**	**101 to 500 branches**	**501 to 1000 branches**	**1001+ branches**
	Mean (Median)				
Deposits per Branch					
Total Deposits	39.3 (32.3)	51.3 (40.2)	51.7 (42.8)	92.6 (49.0)	72.9 (78.6)
Non-head Office Deposits	37.3 (32.2)	43.9 (39.3)	42.6 (37.8)	57.7 (46.9)	56.8 (55.5)
Core Deposits	32.6 (27.6)	43.2 (34.3)	45.3 (39.1)	77.5 (45.4)	66.6 (71.4)
Non-brokered Deposits	38.4 (32.1)	49.2 (39.6)	50.3 (40.9)	86.3 (48.0)	71.1 (73.6)
Small Business Loans per Branch					
Total Small Business Loans	7.6 (6.7)	7.6 (7.2)	6.1 (6.0)	6.9 (6.6)	5.6 (5.5)
"Small" Small Business Loans	3.1 (2.9)	2.9 (2.8)	2.4 (2.5)	3.3 (2.5)	2.5 (2.3)
"Large" Small Business Loans	4.4 (3.7)	4.7 (4.5)	3.7 (3.4)	3.6 (3.6)	3.1 (3.3)
Average Deposit Interest Cost					
Total Deposits	1.46 (1.46)	1.34 (1.43)	1.07 (1.10)	1.02 (1.04)	0.88 (0.93)
Interest-Bearing Deposits	1.72 (1.73)	1.56 (1.60)	1.29 (1.30)	1.25 (1.27)	1.17 (1.15)
Deposit Fees	0.61 (0.54)	0.62 (0.55)	0.85 (0.67)	0.81 (0.86)	0.91 (0.89)
Net Deposit Cost	0.85 (0.83)	0.73 (0.77)	0.22 (0.31)	0.22 (0.12)	-0.04 (-0.07)

Notes: Variables are as of June 2003. Deposit per branch and loan per branch variables are in millions of dollars. Average deposit interest cost and deposit fees are based on annualized Q3 2003 values per dollar of deposits.

Table 4A: Regression Results, Deposits per Branch

	Total Deposits	Non-head Office Deposits	Core Deposits	Non-broker Deposits
Institution Characteristics				
Asset Size:				
$500M to $1B	10.393***	10.477***	8.756***	10.393***
	(1.109)	(0.968)	(0.900)	(1.085)
$1B to $10B	32.606***	28.374***	25.340***	31.055***
	(2.980)	(2.270)	(2.289)	(2.795)
More than $10B	91.679***	49.394***	72.332***	87.624***
	(16.760)	(4.178)	(12.143)	(16.782)
Total Capital Ratio	-58.771	13.768	-30.219	-60.105
	(60.222)	(34.111)	(46.858)	(59.712)
Loans to Assets Ratio	-36.327	4.616	-29.494	-41.492
	(27.836)	(11.828)	(20.118)	(27.521)
Assets from Mergers	-5.836	-2.842	-3.981	-4.091
	(8.887)	(4.813)	(6.919)	(8.710)
Log(Number of Entities)	2.590	1.880*	1.975	2.369
	(1.683)	(1.085)	(1.279)	(1.590)
Market Characteristics				
State Personal Income Growth	-106.996	-177.072***	-100.261*	-84.056
	(77.018)	(41.138)	(57.232)	(75.583)
Average MSA HHI	8.178	-8.103	-4.666	4.278
	(16.055)	(11.131)	(11.826)	(14.442)
Branch Network Characteristics				
Number of States	4.965***	1.091*	3.352**	4.467***
	(1.765)	(0.620)	(1.301)	(1.672)
Number of MSAs	-0.425***	-0.133**	-0.313***	-0.385***
	(0.136)	(0.053)	(0.103)	(0.126)
Average Branches per Capita	-92.879***	-64.868***	-60.735***	-85.823***
	(20.394)	(15.784)	(15.301)	(18.699)
In-store Share	-25.143***	-20.106***	-19.304***	-23.958***
	(6.936)	(4.461)	(5.551)	(6.579)
Branch Network Size:				
11 to 50 Branches	45.305***	22.592***	31.590***	43.276***
	(13.745)	(2.957)	(9.687)	(13.823)
51 to 100 Branches	27.364***	10.468***	19.646***	25.592***
	(9.353)	(3.079)	(7.128)	(9.327)
501 to 1000 Branches	16.412	7.253	13.865	12.655
	(30.576)	(10.538)	(22.880)	(29.518)
More than 1000 Branches	31.262	21.021**	30.203*	28.909
	(20.828)	(10.006)	(16.181)	(19.832)
Number of Observations	682	682	682	682
R-squared	0.42	0.42	0.44	0.42
F-test	0.00	0.00	0.00	0.00

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Deposit per branch variables are in millions of dollars. Total capital, loans to assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people.

Table 4B: Regression Results, Small Business Loans per Branch

	Total Small Business Loans	"Small" Small Business Loans	"Large" Small Business Loans
Institution Characteristics			
Asset Size:			
$500M to $1B	1.977***	0.837***	1.139***
	(0.295)	(0.137)	(0.208)
$1B to $10B	3.588***	1.120***	2.468***
	(0.466)	(0.187)	(0.327)
More than $10B	5.386***	1.492***	3.894***
	(0.851)	(0.344)	(0.598)
Total Capital Ratio	-9.150	-1.684	-7.466*
	(6.014)	(2.355)	(4.173)
Loans to Assets Ratio	6.924***	2.630***	4.294***
	(1.748)	(0.742)	(1.156)
Assets from Mergers	0.169	0.503	-0.333
	(1.008)	(0.472)	(0.663)
Log(Number of Entities)	0.817***	0.460***	0.357**
	(0.261)	(0.113)	(0.171)
Market Characteristics			
State Personal Income Growth	-15.910*	-3.686	-12.224*
	(9.295)	(4.065)	(6.528)
Average MSA HHI	4.195*	2.451**	1.744
	(2.441)	(1.103)	(1.671)
Branch Network Characteristics			
Number of States	0.116	-0.030	0.147
	(0.151)	(0.064)	(0.102)
Number of MSAs	-0.010	-0.001	-0.009*
	(0.008)	(0.004)	(0.005)
Average Branches per Capita	-25.208***	-5.748***	-19.460***
	(3.799)	(1.543)	(2.733)
In-store Share	-4.437***	-1.652***	-2.785***
	(0.924)	(0.432)	(0.612)
Branch Network Size:			
11 to 50 Branches	4.477***	1.371***	3.106***
	(0.628)	(0.268)	(0.415)
51 to 100 Branches	2.114***	0.553*	1.561***
	(0.662)	(0.286)	(0.439)
501 to 1000 Branches	-0.304	0.834	-1.137**
	(1.015)	(0.727)	(0.565)
More than 1000 Branches	-0.685	0.241	-0.926
	(1.019)	(0.503)	(0.759)
Number of Observations	682	682	682
R-squared	0.29	0.18	0.31
F-test	0.00	0.00	0.00

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Small business loans per branch variables are in millions of dollars. Total capital, loans to assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people.

Table 4C: Regression Results, Deposit Interest Cost Variables

	All Deposits	Interest-Bearing Deposits	Deposit Fee Income	Net Deposit Cost
Institution Characteristics				
Asset Size:				
$500M to $1B	-0.040	-0.070	-0.108***	0.069
	(0.045)	(0.046)	(0.037)	(0.065)
$1B to $10B	-0.150***	-0.208***	-0.147***	-0.012
	(0.055)	(0.056)	(0.043)	(0.075)
More than $10B	-0.392***	-0.453***	-0.257*	-0.147
	(0.119)	(0.127)	(0.134)	(0.181)
Total Capital Ratio	-1.698**	-1.916***	0.192	-1.925**
	(0.698)	(0.691)	(0.508)	(0.898)
Loans to Assets Ratio	0.613***	0.609***	-0.163	0.748***
	(0.212)	(0.208)	(0.141)	(0.285)
Assets from Mergers	0.196*	0.206**	-0.184*	0.381**
	(0.105)	(0.103)	(0.094)	(0.148)
Log(Number of Entities)	0.072***	0.080***	-0.038**	0.108***
	(0.022)	(0.023)	(0.018)	(0.030)
Market Characteristics				
State Personal Income Growth	2.591**	2.984**	1.848**	0.969
	(1.121)	(1.190)	(0.846)	(1.397)
Average MSA HHI	0.324	0.390	0.485*	-0.159
	(0.323)	(0.337)	(0.248)	(0.395)
Branch Network Characteristics				
Number of States	0.010	0.012	0.010	-0.003
	(0.016)	(0.016)	(0.033)	(0.034)
Number of MSAs	-0.001	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.002)	(0.002)
Average Branches per Capita	1.003**	0.849*	-0.348	1.327**
	(0.497)	(0.509)	(0.391)	(0.650)
In-store Share	-0.121	-0.025	0.613**	-0.695**
	(0.150)	(0.156)	(0.239)	(0.301)
Branch Network Size:				
11 to 50 Branches	0.180**	0.193**	-0.343***	0.510***
	(0.084)	(0.090)	(0.099)	(0.122)
51 to 100 Branches	0.135	0.141	-0.233**	0.379***
	(0.096)	(0.101)	(0.095)	(0.135)
501 to 1000 Branches	0.090	0.112	-0.007	0.110
	(0.116)	(0.108)	(0.121)	(0.147)
More than 1000 Branches	-0.049	0.041	0.064	-0.109
	(0.110)	(0.132)	(0.110)	(0.128)
Number of Observations	655	655	653	653
R-squared	0.23	0.24	0.13	0.20
F-test	0.16	0.21	0.01	0.00

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Deposit interest cost is in percent. Total capital, loans to assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people.

Table 5: Regression Results, Return on Equity and Market Return

	ROE	Market Return	Risk-Adjusted Market Return	ROE	Market Return	Risk-Adjusted Market Return
Institution Characteristics						
Asset Size:						
$500M to $1B	0.341	-0.525**	-0.235**	-0.126	-0.551**	-0.258**
	(0.687)	(0.249)	(0.101)	(0.610)	(0.260)	(0.106)
$1B to $10B	1.981**	-0.435*	-0.190*	1.415*	-0.467*	-0.221**
	(0.785)	(0.248)	(0.100)	(0.749)	(0.259)	(0.107)
More than $10B	2.603*	-0.198	-0.056	1.366	-0.306	-0.136
	(1.514)	(0.281)	(0.126)	(1.585)	(0.301)	(0.137)
Total Capital Ratio	-2.818	-3.629*	-2.247**	-2.381	-3.257*	-2.027**
	(8.316)	(1.883)	(0.980)	(7.378)	(1.949)	(0.997)
Loans to Assets Ratio	6.869***	-0.352	-0.223	7.317***	-0.291	-0.193
	(2.573)	(0.397)	(0.210)	(2.653)	(0.423)	(0.219)
Non-performing Loans / Total Loans				-225.334***	0.381***	0.223***
				(59.708)	(0.133)	(0.065)
Non-interest Income / Operating Income				0.399	-0.491	-0.977
				(4.032)	(4.004)	(1.887)
Retail Loans / Total Loans				-1.749	-0.220	-0.183
				(1.585)	(0.291)	(0.152)
Trading Assets / Assets				15.967	-0.603	-0.462
				(13.735)	(1.030)	(0.603)
Assets from Mergers	-6.288***	-0.141	-0.028	-5.553***	-0.088	0.007
	(1.746)	(0.242)	(0.128)	(1.728)	(0.253)	(0.135)
Log(Number of Entities)	0.064	-0.006	-0.007	-0.055	-0.006	-0.006
	(0.328)	(0.052)	(0.028)	(0.310)	(0.051)	(0.027)
Market Characteristics						
State Personal Income Growth	11.268	0.940	0.679	2.301	0.279	0.245
	(14.997)	(2.573)	(1.387)	(14.011)	(2.570)	(1.381)
Average MSA HHI	-5.774	-0.909	-0.510	-2.443	-0.708	-0.337
	(6.229)	(0.858)	(0.457)	(5.059)	(0.921)	(0.484)
Branch Network Characteristics						
Number of States	-0.453*	-0.026	-0.012	-0.355	-0.035	-0.018
	(0.235)	(0.026)	(0.015)	(0.259)	(0.027)	(0.016)
Number of MSAs	0.015	0.001	0.001	0.010	0.002	0.001
	(0.016)	(0.001)	(0.001)	(0.016)	(0.001)	(0.001)
Average Branches per Capita	4.706	0.887	0.626	4.815	0.532	0.382
	(8.728)	(1.874)	(0.905)	(8.042)	(1.977)	(0.938)
In-store Share	5.949*	0.252	0.280	4.525	0.260	0.291
	(3.330)	(0.574)	(0.331)	(3.284)	(0.601)	(0.346)
Branch Network Size:						
11 to 50	-1.000	0.247**	0.105	-1.037	0.231*	0.092
	(1.151)	(0.119)	(0.071)	(1.105)	(0.120)	(0.071)
51 to 100	-0.228	0.256**	0.116*	-0.392	0.228*	0.097
	(1.240)	(0.114)	(0.067)	(1.190)	(0.117)	(0.068)
501 to 1000	2.448*	-0.386**	-0.233**	2.870*	-0.340*	-0.195*
	(1.452)	(0.158)	(0.097)	(1.628)	(0.182)	(0.112)
More than 1000	2.312	-0.587**	-0.359**	3.049	-0.535**	-0.317**
	(2.478)	(0.245)	(0.145)	(2.415)	(0.249)	(0.146)
Number of Observations	653	270	270	653	270	270
R-squared	0.07	0.10	0.10	0.18	0.12	0.12
F-test	0.42	0.01	0.02	0.39	0.05	0.11

Notes: Regression is estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. ROE is in percent. Total capital, loans to assets, nonperforming loans to total loans, non-interest income to operating income, retail loans to total loans, trading assets to total assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people.

Table 6: Distribution of Sample by Branch Network Size, 1995 – 2003

Branch Network Size	Number of Institutions								
	2003	2002	2001	2000	1999	1998	1997	1996	1995
11 – 50	557	534	511	496	478	453	429	432	394
51 – 100	48	50	56	52	52	48	50	41	40
101 – 500	57	56	52	57	63	63	64	62	72
501 – 1000	11	8	12	11	9	12	11	13	12
More than 1000	9	9	8	9	8	7	7	7	6
Total	682	657	639	625	610	583	561	555	524

Source: FDIC Summary of Deposits Data

Table 7A: Regression Results, Non-head Office Deposits per Branch, 1995-2003

	2003	2002	2001	2000	1999	1998	1997	1996	1995
Institution Characteristics									
Asset Size:									
$500M to $1B	10.477***	10.444***	10.209***	9.945***	10.606***	11.933***	10.901***	12.407***	11.681***
	(0.968)	(0.965)	(0.949)	(0.996)	(1.021)	(0.950)	(1.045)	(1.029)	(1.178)
$1B to $10B	28.374***	27.991***	27.055***	27.648***	31.287***	28.913***	26.707***	29.709***	29.053***
	(2.270)	(2.401)	(2.186)	(2.255)	(2.620)	(2.207)	(2.605)	(3.225)	(3.083)
More than $10B	49.394***	50.942***	49.476***	46.726***	49.774***	48.505***	43.623***	47.333***	42.565***
	(4.178)	(4.866)	(4.335)	(3.803)	(4.973)	(4.922)	(4.792)	(5.580)	(4.032)
Total Capital Ratio	13.768	17.048	9.690	-9.260	-17.648	-7.623	-13.346	5.144	-6.579
	(34.111)	(28.006)	(22.678)	(21.605)	(21.644)	(21.336)	(21.542)	(17.121)	(14.542)
Loans to Assets Ratio	4.616	3.983	4.132	-2.916	-9.299	-10.597	-14.483	-13.789	-12.390*
	(11.828)	(11.442)	(10.515)	(9.344)	(9.895)	(10.313)	(10.575)	(8.650)	(7.398)
Assets from Mergers	-2.842	-4.394	-6.416*	-7.772**	-10.733***	-2.365	0.231	-3.190	-4.565**
	(4.813)	(4.268)	(3.533)	(3.454)	(3.996)	(5.421)	(5.520)	(5.370)	(2.065)
Log(Number of Entities)	1.880*	0.917	0.821	-0.180	-0.215	0.257	-0.860	-0.582	1.383
	(1.085)	(1.060)	(0.947)	(1.038)	(1.068)	(0.882)	(0.916)	(1.159)	(1.030)
Market Characteristics									
State Personal Income Growth	-177.07***	-141.01***	132.35***	130.03***	116.96***	36.998	62.512**	80.622***	-9.822
	(41.138)	(40.503)	(32.417)	(33.024)	(34.534)	(25.454)	(25.047)	(24.240)	(28.158)
Average MSA HHI	-8.103	-24.177**	-16.807	-21.330*	-14.725	-19.244	-15.802	-24.106*	-35.836***
	(11.131)	(11.826)	(10.421)	(10.912)	(12.686)	(12.062)	(11.313)	(12.445)	(12.483)
Branch Network Characteristics									
Number of States	1.091*	1.961**	1.269*	1.744*	1.383*	2.462**	3.220***	2.920***	2.128**
	(0.620)	(0.819)	(0.741)	(0.905)	(0.783)	(0.969)	(1.209)	(1.037)	(1.043)
Number of MSAs	-0.133**	-0.179***	-0.135**	-0.171**	-0.139**	-0.248***	-0.261***	-0.324***	-0.290***
	(0.053)	(0.064)	(0.053)	(0.071)	(0.064)	(0.075)	(0.087)	(0.088)	(0.090)
Average Branches per Capita	-64.868***	-66.494***	-52.109***	-40.241***	-53.129***	-45.733***	-49.384***	-38.184**	-35.184**
	(15.784)	(14.504)	(12.977)	(14.931)	(16.631)	(16.134)	(15.537)	(15.045)	(16.128)
In-store Share	-20.106***	-26.389***	-24.000***	-23.902***	-23.289***	-20.583***	-18.804***	-85.561	-20.844***
	(4.461)	(4.865)	(4.449)	(5.182)	(5.253)	(4.430)	(5.238)	(58.307)	(6.321)
Branch Network Size:									
11 to 50	22.592***	24.297***	20.313***	17.815***	20.661***	19.536***	17.061***	16.724***	16.885***
	(2.957)	(3.563)	(3.205)	(3.344)	(3.819)	(3.756)	(3.869)	(4.415)	(4.239)
51 to 100	10.468***	12.741***	8.404***	5.957**	8.785**	9.619**	9.113**	6.639	3.909
	(3.079)	(3.539)	(3.004)	(2.831)	(3.876)	(4.084)	(4.009)	(4.236)	(2.667)
501 to 1000	7.253	5.178	1.926	0.371	-0.544	5.247	2.996	7.522	8.264*
	(10.538)	(13.926)	(9.513)	(9.739)	(9.618)	(6.852)	(5.434)	(4.706)	(4.804)
More than 1000	21.021**	17.801*	11.122	9.792	5.781	7.623	5.735	17.240**	23.203**
	(10.006)	(9.805)	(8.297)	(9.091)	(8.788)	(7.945)	(6.759)	(8.700)	(9.257)
Number of Observations	682	657	639	625	610	583	561	555	524
R-squared	0.42	0.43	0.44	0.42	0.41	0.47	0.41	0.38	0.36
F-test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Deposits per branch variables are in millions of dollars. Total capital, loans to assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people. All data are as of June 30 for the year in question.

Table 7B: Regression Results, Total Small Business Loans per Branch, 1995-2003

	2003	2002	2001	2000	1999	1998	1997	1996	1995
Institution Characteristics									
Asset Size:									
$500M to $1B	1.977***	2.085***	2.154***	1.858***	1.994***	2.080***	2.049***	1.935***	1.874***
	(0.295)	(0.290)	(0.309)	(0.300)	(0.322)	(0.326)	(0.285)	(0.315)	(0.327)
$1B to $10B	3.588***	3.665***	3.871***	3.888***	4.620***	4.155***	3.447***	3.533***	3.606***
	(0.466)	(0.485)	(0.482)	(0.526)	(0.556)	(0.547)	(0.531)	(0.529)	(0.460)
More than $10B	5.386***	5.866***	5.210***	5.068***	5.160***	4.633***	4.279***	4.271***	4.143***
	(0.851)	(0.969)	(0.734)	(0.757)	(0.758)	(0.759)	(0.805)	(0.792)	(0.774)
Total Capital Ratio	-9.150	-7.860	-5.830	-8.254*	-8.439*	-6.674	-2.365	-1.036	-2.879
	(6.014)	(5.901)	(4.860)	(4.806)	(4.328)	(4.195)	(3.690)	(3.493)	(3.356)
Loans to Assets Ratio	6.924***	8.044***	6.863***	6.610***	6.176***	5.000***	5.573***	4.618**	4.051**
	(1.748)	(1.815)	(1.727)	(1.864)	(1.850)	(1.773)	(1.756)	(1.893)	(1.635)
Assets from Mergers	0.169	0.619	0.577	0.813	0.804	0.615	1.374	0.211	0.080
	(1.008)	(0.904)	(0.810)	(0.881)	(0.985)	(0.948)	(1.124)	(0.874)	(0.606)
Log(Number of Entities)	0.817***	0.943***	0.723***	0.605**	0.509**	0.490**	0.206	0.161	0.414**
	(0.261)	(0.322)	(0.263)	(0.245)	(0.246)	(0.228)	(0.193)	(0.210)	(0.190)
Market Characteristics									
State Personal Income Growth	-15.910*	-17.546*	6.313	19.432***	32.327***	26.966***	19.248**	22.865***	11.878*
	(9.295)	(10.414)	(6.596)	(6.542)	(7.429)	(7.213)	(7.795)	(6.072)	(6.247)
Average MSA HHI	4.195*	4.302	3.221	4.655	5.897*	4.166	1.688	-0.648	-2.902
	(2.441)	(3.046)	(2.804)	(2.910)	(3.556)	(3.424)	(2.987)	(3.040)	(2.624)
Branch Network Characteristics									
Number of States	0.116	0.278	0.053	0.116	-0.022	-0.030	0.012	0.217	0.234
	(0.151)	(0.197)	(0.125)	(0.169)	(0.088)	(0.133)	(0.149)	(0.162)	(0.174)
Number of MSAs	-0.010	-0.019*	-0.004	-0.010	-0.011*	-0.017*	-0.015	-0.026**	-0.027*
	(0.008)	(0.011)	(0.007)	(0.010)	(0.006)	(0.010)	(0.011)	(0.013)	(0.015)
Average Branches per Capita	-25.208***	-27.090***	-23.637***	-24.950***	-25.408***	-20.446***	-16.112***	-14.259***	-12.330***
	(3.799)	(4.225)	(3.925)	(4.107)	(4.829)	(4.880)	(3.783)	(3.565)	(3.663)
In-store Share	-4.437***	-5.071***	-3.940***	-4.329***	-3.773***	-3.513***	-3.044***	-11.668	-3.290*
	(0.924)	(1.125)	(1.071)	(1.253)	(1.404)	(1.023)	(1.157)	(13.739)	(1.995)
Branch Network Size:									
11 to 50	4.477***	4.793***	4.132***	4.564***	4.311***	3.768***	3.014***	3.110***	3.438***
	(0.628)	(0.804)	(0.698)	(0.730)	(0.675)	(0.601)	(0.651)	(0.623)	(0.597)
51 to 100	2.114***	2.008***	1.286**	1.553**	0.966*	1.126*	1.239**	1.449**	0.782
	(0.662)	(0.742)	(0.557)	(0.610)	(0.577)	(0.574)	(0.604)	(0.586)	(0.638)
501 to 1000	-0.304	-0.844	-0.519	-0.254	0.120	1.535**	-0.035	0.023	-0.550
	(1.015)	(1.053)	(0.714)	(0.803)	(0.705)	(0.756)	(0.720)	(0.659)	(0.609)
More than 1000	-0.685	-0.821	-1.585*	-0.748	0.287	0.211	-0.535	-0.513	-0.463
	(1.019)	(1.168)	(0.862)	(1.210)	(1.314)	(1.034)	(1.234)	(1.365)	(1.558)
Number of Observations	682	657	639	625	610	583	561	555	524
R-squared	0.29	0.29	0.27	0.28	0.30	0.29	0.23	0.24	0.26
F-test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Small business loans per branch variables are in millions of dollars. Total capital, loans to assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people. All data are as of June 30 for the year in question.

Table 7C: Regression Results, Deposit Interest Cost Net of Fees, 1995-2003

	2003	2002	2001	2000	1999	1998	1997	1996	1995
Institution Characteristics									
Asset Size:									
$500M to $1B	0.069	-0.003	-0.004	0.121	0.019	0.018	0.039	0.116	0.223**
	(0.065)	(0.074)	(0.085)	(0.082)	(0.073)	(0.084)	(0.091)	(0.081)	(0.098)
$1B to $10B	-0.012	-0.104	-0.021	0.199**	0.128	0.027	0.108	0.197**	0.159
	(0.075)	(0.080)	(0.094)	(0.100)	(0.081)	(0.091)	(0.106)	(0.098)	(0.115)
More than $10B	-0.147	-0.482**	-0.277	0.023	-0.217	-0.332*	-0.066	0.088	-0.132
	(0.181)	(0.196)	(0.213)	(0.370)	(0.185)	(0.198)	(0.241)	(0.170)	(0.212)
Total Capital Ratio	-1.925**	-1.750*	-1.645	-2.251*	-0.896	-0.661	-1.174	-0.077	0.219
	(0.898)	(1.039)	(1.103)	(1.291)	(0.820)	(0.851)	(0.940)	(0.861)	(1.025)
Loans to Assets Ratio	0.748***	1.032***	1.774***	2.354***	2.473***	2.173***	2.499***	2.381***	2.747***
	(0.285)	(0.331)	(0.412)	(0.449)	(0.395)	(0.434)	(0.479)	(0.420)	(0.524)
Assets from Mergers	0.381**	0.357**	0.289	0.248	0.216	-0.007	-0.235	-0.123	-0.531**
	(0.148)	(0.158)	(0.207)	(0.208)	(0.158)	(0.203)	(0.246)	(0.241)	(0.254)
Log(Number of Entities)	0.108***	0.128***	0.132***	0.184***	0.146***	0.162***	0.177***	0.189***	0.151**
	(0.030)	(0.035)	(0.042)	(0.042)	(0.036)	(0.045)	(0.046)	(0.050)	(0.061)
Market Characteristics									
State Personal Income Growth	0.969	-4.093**	-7.128***	-5.522***	-5.248***	-6.688***	-6.269***	-2.062	-0.218
	(1.397)	(1.714)	(1.700)	(1.515)	(1.303)	(1.400)	(1.767)	(1.459)	(1.757)
Average MSA HHI	-0.159	-0.564	0.519	0.867	-0.154	0.615	0.417	-0.185	0.585
	(0.395)	(0.626)	(0.587)	(0.732)	(0.596)	(0.655)	(0.681)	(0.618)	(0.745)
Branch Network Characteristics									
Number of States	-0.003	-0.019	-0.008	-0.000	-0.038**	-0.021	-0.008	-0.105***	-0.077
	(0.034)	(0.026)	(0.030)	(0.038)	(0.016)	(0.025)	(0.041)	(0.036)	(0.050)
Number of MSAs	-0.000	0.001	-0.000	0.002	0.005***	0.012***	0.005	0.005	0.004
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.004)	(0.004)
Average Branches per Capita	1.327**	1.579**	1.631*	-0.119	1.282	-0.308	0.829	2.451***	2.865***
	(0.650)	(0.797)	(0.841)	(0.990)	(0.814)	(0.902)	(1.081)	(0.905)	(0.939)
In-store Share	-0.695**	-1.368***	-1.062***	-1.328***	-1.642***	-1.469***	-0.787	3.024	-0.489
	(0.301)	(0.473)	(0.363)	(0.355)	(0.378)	(0.519)	(0.682)	(5.770)	(0.682)
Branch Network Size:									
11 to 50	0.510***	0.381***	0.743***	0.747***	0.631***	0.748***	0.817***	0.627***	0.393**
	(0.122)	(0.142)	(0.160)	(0.280)	(0.147)	(0.143)	(0.182)	(0.125)	(0.165)
51 to 100	0.379***	0.361**	0.619***	0.461	0.439**	0.464***	0.354*	0.252**	-0.010
	(0.135)	(0.165)	(0.163)	(0.304)	(0.186)	(0.162)	(0.191)	(0.127)	(0.155)
501 to 1000	0.110	0.066	0.071	-0.078	-0.141	-0.719***	-0.658***	-0.178	-0.219
	(0.147)	(0.139)	(0.248)	(0.367)	(0.205)	(0.268)	(0.162)	(0.216)	(0.282)
More than 1000	-0.109	-0.251	-0.224	-1.094**	-1.004***	-1.787***	-0.904**	-0.680*	-0.960
	(0.128)	(0.196)	(0.355)	(0.514)	(0.179)	(0.381)	(0.395)	(0.393)	(0.620)
Number of Observations	653	638	610	592	565	531	512	519	486
R-squared	0.20	0.22	0.27	0.25	0.32	0.29	0.27	0.26	0.29
F-test	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.07

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Deposit interest cost is in percent. Total capital, loans to assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people. All data are as of June 30 for the year in question.

Table 7D: Regression Results, Return on Equity, 1995-2003

	2003	2002	2001	2000	1999	1998	1997	1996	1995
Institution Characteristics									
Asset Size:									
$500M to $1B	-0.126	0.601	-0.018	-0.194	1.724**	-0.298	0.473	0.298	0.837
	(0.610)	(0.566)	(0.585)	(0.603)	(0.706)	(0.691)	(0.498)	(0.844)	(0.558)
$1B to $10B	1.415*	1.322*	0.543	0.597	2.697***	0.420	0.553	0.978	1.473*
	(0.749)	(0.755)	(0.753)	(0.789)	(0.876)	(0.711)	(0.599)	(0.980)	(0.778)
More than $10B	1.366	2.095	0.563	-1.917	1.867	1.719	1.157	1.632	3.359***
	(1.585)	(2.271)	(2.756)	(3.067)	(1.651)	(2.180)	(1.381)	(1.851)	(1.275)
Total Capital Ratio	-2.381	-14.601**	-0.994	-8.228	-9.129	-0.046	-12.839**	-21.819***	-5.782
	(7.378)	(5.880)	(6.057)	(5.496)	(7.460)	(8.950)	(5.870)	(7.601)	(9.552)
Loans to Assets Ratio	7.317***	-2.603	4.237	4.634	-1.933	7.672**	-0.348	-3.399	2.582
	(2.653)	(2.673)	(2.677)	(2.882)	(3.296)	(3.379)	(2.598)	(4.159)	(2.707)
Non-performing Loans / Total Loans	-225.33***	-229.77***	-200.35***	-96.83**	-161.37***	-95.165*	-23.283	26.554	-98.635***
	(59.708)	(37.166)	(40.871)	(39.250)	(35.972)	(55.525)	(29.342)	(22.543)	(33.731)
Non-interest Income / Operating Income	0.399	5.990	10.080***	2.190	0.564	11.332***	8.243***	3.566	-0.831
	(4.032)	(3.792)	(3.891)	(3.336)	(3.713)	(2.774)	(2.924)	(5.156)	(3.348)
Retail Loans / Total Loans	-1.749	-3.338*	-1.394	-4.064**	0.497	-1.542	-1.004	1.700	1.324
	(1.585)	(1.709)	(1.841)	(1.779)	(1.589)	(2.081)	(1.588)	(2.247)	(2.057)
Trading Assets / Assets	15.967	-46.980***	-63.956**	21.401	10.238	-83.498	-34.411**	-15.381	-5.547
	(13.735)	(17.927)	(25.754)	(16.259)	(19.777)	(56.260)	(14.882)	(19.446)	(7.856)
Assets from Mergers	-5.553***	-0.158	-1.153	-2.333	-4.051**	-0.629	-2.217*	-0.373	1.193
	(1.728)	(1.538)	(1.745)	(1.755)	(1.609)	(1.820)	(1.264)	(1.621)	(1.511)
Log(Number of Entities)	-0.055	0.395	-0.109	0.047	-0.482*	-0.061	-0.211	0.947**	0.116
	(0.310)	(0.324)	(0.415)	(0.371)	(0.288)	(0.326)	(0.279)	(0.409)	(0.343)
Market Characteristics									
State Personal Income Growth	2.301	4.812	23.156*	48.531***	34.473***	31.479***	15.032	27.296*	36.786***
	(14.011)	(15.549)	(13.292)	(8.395)	(10.148)	(11.480)	(10.185)	(14.222)	(11.224)
Average MSA HHI	-2.443	-2.529	-4.084	-8.822**	0.962	-1.606	0.558	13.595**	0.287
	(5.059)	(5.308)	(5.005)	(4.486)	(4.750)	(5.154)	(3.950)	(5.607)	(4.127)
Branch Network Characteristics									
Number of States	-0.355	-0.444*	-0.336	0.278	0.213	-0.035	-0.129	0.451	0.392
	(0.259)	(0.247)	(0.283)	(0.295)	(0.142)	(0.270)	(0.344)	(0.359)	(0.470)
Number of MSAs	0.010	0.024	0.014	-0.038*	-0.002	-0.008	0.036	-0.058**	-0.024
	(0.016)	(0.019)	(0.022)	(0.022)	(0.021)	(0.034)	(0.022)	(0.029)	(0.025)
Average Branches per Capita	4.815	0.470	2.978	18.101**	4.073	3.633	0.522	-14.226**	-1.240
	(8.042)	(8.300)	(7.283)	(8.235)	(6.682)	(8.651)	(6.185)	(6.981)	(6.424)
In-store Share	4.525	5.127*	4.612	3.023	-0.538	-3.895	-2.484	93.566	-12.807*
	(3.284)	(2.998)	(3.402)	(2.925)	(4.250)	(3.065)	(3.824)	(61.418)	(7.414)
Branch Network Size:									
11 to 50	-1.037	0.189	-0.956	-0.748	-1.599	0.549	0.345	1.329	1.269
	(1.105)	(1.946)	(2.508)	(2.131)	(1.002)	(1.698)	(1.000)	(0.946)	(0.936)
51 to 100	-0.392	0.527	-0.727	0.785	-0.430	2.833	1.733	1.013	1.779**
	(1.190)	(1.908)	(2.579)	(2.301)	(1.138)	(1.815)	(1.085)	(0.850)	(0.900)
501 to 1000	2.870*	2.421	2.038	0.274	-1.070	1.680	0.324	3.789**	-0.234
	(1.628)	(1.845)	(2.632)	(4.669)	(1.960)	(2.591)	(1.618)	(1.736)	(0.939)
More than 1000	3.049	2.632	-2.128	3.647	1.199	1.040	-5.253**	1.649	2.749
	(2.415)	(2.797)	(3.308)	(6.159)	(2.983)	(3.987)	(2.630)	(3.638)	(3.278)
Number of Observations	653	637	612	590	564	528	512	519	483
R-squared	0.18	0.14	0.12	0.12	0.14	0.13	0.12	0.08	0.18
F-test	0.39	0.76	0.61	0.72	0.37	0.10	0.07	0.14	0.26

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. ROE is in percent (annualized). Market return and risk-adjusted market return are in percent per week. Total capital, loans to assets, non-performing loans to total loans, non-interest income to operating income, retail loans to total loans, trading assets to total assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people. Return of equity is based on annualized data from the third quarter of the year in question.

Table 7E: Regression Results, Risk-Adjusted Market Return, 1995-2003

	2003	2002	2001	2000	1999	1998	1997	1996	1995
Institution Characteristics									
Asset Size:									
$500M to $1B	-0.258**	0.056	-0.077	-0.154	0.158	0.083	-0.062	0.044	0.115
	(0.106)	(0.089)	(0.091)	(0.105)	(0.125)	(0.081)	(0.087)	(0.082)	(0.090)
$1B to $10B	-0.221**	-0.136	-0.167*	-0.022	0.165	0.095	-0.064	0.123	0.196**
	(0.107)	(0.085)	(0.087)	(0.102)	(0.128)	(0.083)	(0.086)	(0.087)	(0.088)
More than $10B	-0.136	-0.236*	-0.425***	0.314*	0.240	0.136	-0.018	0.133	0.249*
	(0.137)	(0.139)	(0.148)	(0.176)	(0.198)	(0.166)	(0.140)	(0.139)	(0.136)
Total Capital Ratio	-2.027**	0.349	0.701	-0.271	0.398	-0.826	-1.996**	-0.643	0.282
	(0.997)	(0.893)	(1.178)	(1.396)	(1.293)	(0.903)	(0.938)	(1.004)	(0.910)
Loans to Assets Ratio	-0.193	-0.310	0.231	0.098	-0.534*	-0.228	-0.266	0.216	-0.022
	(0.219)	(0.241)	(0.304)	(0.358)	(0.304)	(0.279)	(0.340)	(0.328)	(0.301)
Non-performing Loans / Total Loans	0.223***	-0.259	-0.051	-0.015	-1.270***	0.105	0.234	0.011	-0.004
	(0.065)	(0.274)	(0.290)	(0.340)	(0.338)	(0.250)	(0.270)	(0.277)	(0.361)
Non-interest Income / Operating Income	-0.977	-0.985	-3.177	-1.252	-7.504	-4.382	2.415	-0.978	-5.106*
	(1.887)	(3.822)	(4.271)	(8.136)	(4.717)	(5.253)	(5.575)	(3.432)	(2.903)
Retail Loans / Total Loans	-0.183	0.042	0.002	-0.232	-0.052	0.305	-0.006	-0.182	-0.433**
	(0.152)	(0.167)	(0.184)	(0.232)	(0.205)	(0.191)	(0.230)	(0.208)	(0.212)
Trading Assets / Assets	-0.462	-2.813***	-2.492	-0.949	2.402	-5.795***	-2.369	-1.563	0.364
	(0.603)	(0.782)	(1.983)	(1.403)	(1.970)	(1.657)	(2.004)	(1.329)	(1.125)
Assets from Mergers	0.007	-0.134	0.084	0.038	-0.219	-0.046	0.163	0.069	0.116
	(0.135)	(0.115)	(0.127)	(0.179)	(0.164)	(0.152)	(0.277)	(0.133)	(0.157)
Log(Number of Entities)	-0.006	-0.041	0.030	0.003	-0.036	-0.039	-0.009	-0.076**	-0.057
	(0.027)	(0.035)	(0.036)	(0.038)	(0.039)	(0.036)	(0.036)	(0.034)	(0.035)
Market Characteristics									
State Personal Income Growth	0.245	2.479*	1.301	3.816***	1.531	-2.875**	-2.754**	0.238	2.305*
	(1.381)	(1.441)	(1.178)	(1.273)	(1.303)	(1.154)	(1.347)	(1.324)	(1.235)
Average MSA HHI	-0.337	-0.024	0.206	-1.035	-0.311	-0.326	-2.215***	-0.779	0.196
	(0.484)	(0.514)	(0.669)	(0.794)	(0.715)	(0.548)	(0.621)	(0.598)	(0.638)
Branch Network Characteristics									
Number of States	-0.018	-0.006	-0.031	0.033**	0.006	-0.025	0.009	0.059*	0.008
	(0.016)	(0.018)	(0.022)	(0.015)	(0.012)	(0.019)	(0.026)	(0.032)	(0.027)
Number of MSAs	0.001	0.001	0.001	-0.001	-0.003**	0.003	0.000	0.002	-0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Average Branches per Capita	0.382	0.202	-0.794	0.169	1.341	1.291	2.900**	1.077	-0.756
	(0.938)	(0.988)	(1.349)	(1.233)	(1.502)	(1.194)	(1.142)	(1.239)	(1.161)
In-store Share	0.291	-0.025	0.236	-0.103	0.598	-0.374*	0.052	-2.726	-0.701
	(0.346)	(0.220)	(0.382)	(0.302)	(0.388)	(0.213)	(0.426)	(3.859)	(0.718)
Branch Network Size:									
11 to 50	0.092	-0.148*	-0.126	-0.087	0.244**	0.055	-0.071	-0.084	0.060
	(0.071)	(0.089)	(0.100)	(0.142)	(0.121)	(0.121)	(0.115)	(0.102)	(0.092)
51 to 100	0.097	-0.074	-0.273***	-0.092	0.181	0.294**	-0.125	-0.077	0.082
	(0.068)	(0.097)	(0.101)	(0.143)	(0.115)	(0.114)	(0.095)	(0.104)	(0.095)
501 to 1000	-0.195*	-0.055	0.174	-0.290	0.169	0.141	-0.064	0.090	-0.076
	(0.112)	(0.090)	(0.176)	(0.214)	(0.180)	(0.186)	(0.106)	(0.098)	(0.142)
More than 1000	-0.317**	-0.094	0.236	-0.208	0.204	0.130	-0.621***	-0.662*	0.224
	(0.146)	(0.180)	(0.162)	(0.267)	(0.241)	(0.335)	(0.218)	(0.364)	(0.264)
Number of Observations	270	275	261	262	258	240	233	243	231
R-squared	0.12	0.14	0.12	0.21	0.22	0.18	0.15	0.19	0.12
F-test	0.11	0.53	0.03	0.64	0.26	0.01	0.02	0.02	0.63

Notes: Regressions are estimated with robust standard errors, which are in parentheses. ***, ** and * indicate significance at the 1%, 5%, and 10% levels. The F-test row reports the p-values of a test of the joint significance of the branch network size dummy variables. The omitted asset size group is organizations with under $500 million in assets and the omitted branch network size group is organizations with 101 to 500 branches. Risk-adjusted market return is in percent per week. Total capital, loans to assets, non-performing loans to total loans, non-interest income to operating income, retail loans to total loans, trading assets to total assets, assets acquired via merger, in-store share, and state personal income growth are ratios. HHI variables are expressed from 0 to 1. Branches-per-capita variables are branches per thousand people. Risk-adjusted returns are based on weekly stock returns from the third quarter of the year in question.