



# Why Are Some Banks More Profitable?

Despite major changes in the financial services industry over recent years, effective management remains the most important element in determining banks' profitability—overshadowing either bank size or market concentration.

A bank's profitability may be affected by numerous factors, including its asset and liability portfolio management, its management's control over operations costs, its size, the concentration in its local market, its local market conditions and its luck. Moreover, the relative importance of these factors can change over time. This study is the first of a two part series that examines the determinants of bank profitability. This part first seeks to exclude the effects of luck and regional factors on bank profits, and then compares some key financial ratios to determine which of the remaining factors have had a significant impact on profitability.<sup>1</sup> We will address the question both by looking for changes in the important factors over two periods (1972-1977 and 1978-1981) and by examining changes in bank balance sheet ratios between those periods. The second study will use statistical cost analysis to determine if we would observe profitability differences across banks even if their portfolios were identical.

Our study indicates that in both periods the key factor behind high profitability was good management. Neither bank size nor market concentration played a significant role in bank profitability. The study also implies that recent changes in the banking environment have not

<sup>1</sup>This paper summarizes a Federal Reserve Bank of Atlanta working paper with the same title.

significantly affected the determinants of bank profitability.

## Concerns of Managers and Regulators

An understanding of the relative importance of the determinants of bank profitability is important to bank managers and to regulators who are concerned with banks' safety and soundness. Both groups can use this information to focus their attention on the most important elements of a bank's operations. For example, if controlling operating costs is relatively more important to bank profitability in practice than is the bank's asset mix, then managers and regulators should make a point of carefully analyzing the bank's control over operating expenses even if it means they can spend less time looking at its asset portfolio.

The effect of bank size and market concentration on profits also has important implications for public policy towards banking. Some people believe that large banks enjoy significant economies of scale that allow them to earn a higher rate of return than smaller banks. Others believe that small banks are closer to their customers and can act more quickly, allowing them to earn higher rates of return. If large banks do have significant economies of scale and if deregulation increases competition between banks, then deregulation potentially might drive small banks out of business. If large banks do not enjoy economies of scale, then small banks need not fear deregulation.

The degree of concentration in a market is important because regulators use that factor in bank merger cases as a proxy for the intensity of competition in a market. If a small number of firms dominate a particular market, then that market is said to be highly concentrated. High degrees of concentration in a market in theory are associated with decreased competition between banks and with high levels of profits. Regulators carefully scrutinize mergers in highly concentrated markets. If concentration does not

actually have a significant effect on bank profits, then either concentration is a poor measure of the competition between banks or else competition between banks does not affect bank profitability (perhaps because of competition from nonbank financial firms). In either case, if concentration has no significant effect on bank profits, then the justification for its use in bank merger cases is weakened.

## Bank Profitability Studies

Previous studies on the determinants of bank profitability can be split into three groups: studies of economies of scale, studies of the effect of market concentration, and studies attempting to identify the ratios most closely linked with bank earnings performance. Studies have found no economies of scale for banks in excess of \$100 million.<sup>2</sup> Studies of market concentration typically have found that higher levels of concentration are associated with bank profits that, statistically, are significantly higher, but that the quantitative effect is small.<sup>3</sup>

Several previous studies have attempted to identify the ratio or ratios most closely identified with bank earnings performance.<sup>4</sup> These studies have compared a variety of bank income statement and balance sheet ratios to identify ratios that are significantly related to a bank's profitability. These studies have generally found that expense ratios, particularly non-interest expense ratios, are significantly lower at the highly profitable banks. All of these studies, however, suffered from one or more flaws that limited their ability to identify the underlying factors influencing bank profitability. One flaw was a failure to recognize that banks affiliated with holding companies may operate differently from independent banks.<sup>5</sup> Another flaw was that most of the studies ranked banks according to their results over a one or two-year period, thus diluting the tests of other factors by allowing random luck to influence the tests. We have tried to avoid these flaws in this study. Our sample consists of independent

<sup>2</sup>See the November 1982 issue of this *Economic Review* for a discussion of economies of scale.

<sup>3</sup>Rhoades (10) summarizes recent studies of market concentration. A recent study by Kwast and Rose (9) using an expanded statistical cost model also concludes that market concentration—but not bank size—affects bank profitability.

<sup>4</sup>Among these studies are studies by Ford (2), Gady (4), Haslem (5, 6), Haslem and Longbrake (7) and Kwast and Rose (8).

<sup>5</sup>There are several problems with trying to include independent and affiliated banks in the same study of bank profitability. One problem is that affiliated banks' portfolios may be more specialized or more risky than the portfolios of independent banks because other holding company affiliates can counterbalance any unusual features. Another problem is that it is not always clear whether the assets of the bank or the assets of the holding company offer the best measure of the size of the entity. A third problem is that affiliated banks may also upstream their earnings through management fees rather than dividends which will distort comparisons of operating expense ratios.

banks with consistent profitability records over a 10-year period and total assets between \$50 and \$500 million in 1982.<sup>6</sup>

The applicability of prior bank ratio studies for bank profitability also is suspect because they have focused on bank operations in the 1960s and early 1970s. During that period, interest rates were relatively stable and deposit rate regulation limited banks'—particularly small banks'—ability to compete for funds. The environment of the late 1970s and early 1980s has been characterized by higher and more volatile interest rates and by deposit rate deregulation. Therefore, even if non-interest expenses were the prime determinant of a bank's profitability earlier, they may not be the key to profitability in the 1980s. We split this study into two periods, 1972-1977 and 1978-1981, to see if the factors determining bank profitability have changed with the changing environment.<sup>7</sup>

### Determinants of Bank Profitability

This study looks at several factors that can influence a bank's profitability (as measured by the ratio of the bank's net income to total assets): its market concentration, its size, its asset portfolio, its liability portfolio and its cost control. We assess the relative importance of these factors with multiple linear regression.<sup>8</sup> The first step in the analysis is to determine the relative importance of concentration, size, and managerial factors. When managerial factors turn out to be more important, further analysis is conducted to determine the relative importance of the bank's asset portfolio, its liability portfolio and its cost management.

The statistical evidence indicated that in both periods the primary reason some banks were more profitable is that they were managed differently (Table 1).<sup>9</sup> The regressions provided only very weak evidence in support of the hypotheses that

**Table 1.** Determinants of Bank Profitability

The most profitable banks:	1972-1977		1978-1981	
	Yes	No	Yes	No
1. are in more concentrated markets		x		x
2. are larger		x		x
3. are smaller		x		x
4. are managed differently	x		x	

Source: Federal Reserve Bank of Atlanta

the bank's size and the average degree of concentration it faced were significantly related to its profitability.<sup>10</sup> This suggests that size and average market concentration do not affect bank profitability, but this issue is also explored in the second part of this series using a superior theoretical model. This evidence on the effect of size and concentration is in general accord with other studies that find that these factors have little or no influence.

Our finding that bank size does not affect bank profitability is subject to one important qualification: the sample used in this study is limited to banks with between \$50 and \$500 million in assets in 1981. Within this size range, however, evidence suggested that the more profitable banks are managed differently from less profitable banks. This result agrees with the findings of numerous studies, including our November 1982 **Economic Review**, that large banks do not have lower costs than small banks. It suggests that large banks will not be able to drive small banks out of existence by virtue of size alone.

A bank's management can exert its influence in a variety of ways that affect both the bank's revenues and expenses. We analyzed management's effect on profits in a two-step process: first we compared the adjusted revenues and the expenses of high and low profit banks, then we

<sup>6</sup>See the Appendix for a more detailed description of the sample selection process. While limiting the scope of this study to banks with consistent profitability records reduces the role of luck, it may obscure some valuable information about bank profitability. Specifically some changes in profitability rankings are due to non-random factors which may be of interest. For example, banks that performed well during the early 1970s may have had a problem adapting to the new environment of the late 1970s and early 1980s.

<sup>7</sup>The choice of 1978 to begin the second period is somewhat arbitrary, but it is used because that is the year that significant deposit rate deregulation began.

<sup>8</sup>See the Appendix for a more detailed discussion of the statistical analysis.

<sup>9</sup>The statistical analysis actually compared the most profitable banks, ranked by return on assets, with three other groups of progressively less profitable banks. The comparisons between the most profitable and each of the three other groups of banks are in general however, identical. Therefore the three groups of less profitable banks are treated as one group in this discussion. One important exception to the findings discussed below is that the non-interest expenses of the second most profitable group of banks are not significantly greater than those of the most profitable banks in the 1978-1981 subperiod.

<sup>10</sup>No evidence of any size or concentration effects are found when the quartile dummy variables are excluded in the regression. If the quartile dummy variables are included, the only coefficient significant at the 5 percent level in a profitability equation is the coefficient on market concentration in the 1978-1981 return on equity equation.

**Table 2. Revenue and Expense Differences**

The most profitable banks:	1972-1977		1978-1981	
	Yes	No	Yes	No
1. have higher interest revenues		x		x
2. have higher non-interest revenues		x		x
3. have lower interest expenses	x		x	
4. have lower non-interest expenses	x		x	
5. have lower taxes relative to their operating income		x		x

Source: Federal Reserve Bank of Atlanta

formulated and tested hypotheses relating bank operations to revenue or expense differences.<sup>11</sup> The statistically significant differences between the banks showed up in their non-interest and interest expenses in both the 1972-1977 and 1978-1981 periods (Table 2). The differences in the banks' non-interest and interest revenue are insignificant. Furthermore, the most profitable banks were no more efficient in turning pretax income into after-tax income than were the less profitable banks. Apparently the most profitable banks are able to hold down costs without sacrificing revenue.

### Non-Interest Costs

A bank's non-interest costs may be influenced by its mix of assets, its mix and amount of liabilities and the effectiveness of its management in controlling operating expenses.<sup>12</sup> Table 3 presents hypotheses relating each of these potential influences and the results of those tests.

The mix of assets can affect the bank's non-interest costs because some assets, such as loans, are more expensive to service than are other assets, such as securities. An extreme example of this is the difference in the servicing

<sup>11</sup>Adjusted revenues are revenues adjusted to arrive at expected tax equivalent revenues. The two adjustments made are that income from securities exempt from federal taxation is increased by the bank's marginal federal tax rate and loan losses are deducted from revenue.

<sup>12</sup>Another factor which could influence bank expenses is the amount of costly services it provides to its customers. If one bank is providing more costly services to its customers than another bank then it should have higher non-interest revenue unless it is giving away the service for free. As is noted above, there is no significant difference in the non-interest revenue earned at most profitable banks versus that earned at less profitable banks. This suggests that less profitable banks are not providing more services to their customers. There is, however, no way to tell from the Reports of Income and Condition data if one bank is giving its customers more free services than another bank.

**Table 3. Reasons for Lower Expenses**

The most profitable banks have lower non-interest expenses because:	1972-1977		1978-1981	
	Yes	No	Yes	No
1. their asset portfolios are less costly to service	x		x	
2. their liability mixes are less costly to service			x	
3. they rely more on equity financing	x		x	
4. they have better controls on operating costs	x		x	

**The most profitable banks have lower interest expenses because:**

1. their liability mix contains more non-interest bearing liabilities	x		x	
2. they rely more on equity financing	x		x	

Source: Federal Reserve Bank of Atlanta

costs of securities and credit cards. According to the Federal Reserve's 1981 Functional Cost Analysis (FCA) data, credit cards are 10 to 13 cents more expensive per dollar invested to service than are securities. The evidence from our study suggests that the most profitable banks do have asset portfolios that are less expensive to service. The most profitable banks had more securities especially state and local securities, and fewer loans than did less profitable banks.<sup>13</sup>

The mix of liabilities is also important because some liabilities are more expensive to service than others. For example, demand deposits are 3.3 to 3.4 cents more expensive per dollar to service than are time and savings deposits according to the 1981 FCA data. We did not find that the liability mix at the most profitable banks contributed to their lower non-interest expenses. In fact we found the exact opposite, that most profitable banks have more demand deposits and fewer time deposits than less profitable banks.<sup>14</sup> The higher non-interest costs of the liability portfolio approximately offset the lower non-interest costs of the asset portfolio.

A third way that profitable banks reduce their non-interest expenses is by reducing their use of

<sup>13</sup>This analysis is not meant to suggest that the marginal net return on securities is higher than that on loans at the most profitable banks. This comparison of financial ratios is not powerful enough to draw such a conclusion. The only conclusion that can be drawn is that the most profitable banks' gross earnings on all of their assets is not significantly different from that of the other banks but that the most profitable have asset portfolios that appear to have lower non-interest costs.

<sup>14</sup>The difference between the high and low profit banks liability mixes narrowed, however, from the 1972-1977 to the 1978-1981 periods.

liabilities and using more equity funding. The accounting costs of equity funding are small compared to those of liabilities. Thus, a bank with more equity will report larger profits and a larger return on assets.<sup>15</sup> The most profitable banks have significantly higher equity to total asset ratios than the less profitable.

Indirect evidence suggests that managers of the most profitable banks also exercise more control over their operating costs.<sup>16</sup> The magnitude of the difference in non-interest costs between the most profitable banks and less profitable banks cannot be explained by differences in the mix of assets, the mix of liabilities and the amount of liabilities issued by the respective groups of banks.

### Interest Costs

A bank's interest costs are determined by the mix and amount of its liabilities. Some liabilities, like time deposits, pay interest while other liabilities, such as demand deposits, are paid for through the provision of "free" services to customers. A bank that has relatively more demand deposits and fewer time deposits will pay less interest than a bank with fewer demand deposits and more time deposits. The most profitable banks have more demand deposits and fewer time deposits, which helps explain their lower interest costs.

Another determinant of a bank's interest expense is its relative mix of debt and equity. The more equity a bank has, the lower its interest expenses will be. The most profitable banks have more equity than the less profitable banks. Thus the most profitable banks have lower interest costs because they use more equity funding and rely more on demand deposits than on time and savings deposits.

Overall these results suggest that bank asset, liability and cost management are all important, and (as detailed in the next section) that recent

changes in the banking environment have not significantly affected the determinants of bank profitability. The most profitable banks held asset portfolios that were less costly to service than those of the other banks, yet yielded the same amount of interest revenue. The most profitable banks held a mix of liabilities that generated lower interest costs, yet these banks also had lower non-interest expenses. Finally, these banks lowered their costs by relying more heavily on equity funding than did the less profitable banks.

### Comparison of Changes Through Time

The banking environment changed dramatically from the early 1970s to the early 1980s. Market interest rates rose, new nonbank competitors emerged, and banks received new powers to compete with each other. We will look at banks in four different profitability groups to see if they responded in the same way to the changing environment. This section focuses on the banks' balance sheets because the increase in market interest rates would change the income ratios even if bank behavior did not.

The previous sections suggest that banks in all four profitability groups experienced similar reactions to the environmental changes; this finding is supported by the data in this section. Banks in all four groups showed decreases in their demand deposits and increases in their other assets; time and savings deposits; and federal funds (Tables 4-5). Groups 1, 3 and 4 showed a drop in their other securities. Group 1 also showed decreases in cash and increases in their total loans, and their equity to total asset ratios. Group 3 had decreases in their state and local securities portfolio and increases in their total loan portfolio.

The remarkable similarity of the changes in banks' portfolios is in accord with the comparisons discussed above. Those comparisons also failed to turn up many dramatic changes between the two periods. These findings suggest that the road to consistently high bank profitability (as measured by banks' return on assets) has not changed in recent years.

### Conclusion

This half of the two-part study of bank profitability suggests that a bank's management policies—its assets and funding practices, and its non-interest cost controls—all have a significant effect

<sup>15</sup>This is not to suggest that bank shareholders are automatically better off if the bank replaces its outstanding liabilities with debt. While an increase in bank equity increases the bank's return on assets, it will usually dilute the bank's earnings and lower its return on equity. There are good reasons for believing that every bank has an optimal debt to equity ratio and that too much equity actually lowers returns to bank stockholders. Barnea, Haugen and Senbet (1) discuss the debt/equity decision for corporations in general and Taggard and Greenbaum (11) discuss the effect of deposit insurance on the optimal debt to equity ratio at banks. The optimal debt to equity ratio for corporations in general and banks in specific is very hard to determine in practice and we can not therefore say whether any of the banks in this survey are over or under capitalized.

<sup>16</sup>Note loan losses are included as a part of adjusted revenue and are not in this measure of non-interest expenses.

**Table 4.** Changes in Selected Assets as a Proportion of Total Assets  
From 1972-1977 to 1978-1981

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Cash	-0.01227 (0.0002)	-0.00521 (0.2482)	-0.00174 (0.7323)	-0.00179 (0.6022)
U.S. Govt. Securities	-0.01411 (0.0518)	0.00334 (0.7720)	-0.00951 (0.2914)	-0.00176 (0.8190)
State and Local Securities	-0.00796 (0.0523)	-0.00680 (0.3704)	-0.01166 (0.0200)	-0.01392 (0.0528)
Other Securities	-0.00142 (0.0347)	-0.00380 (0.0534)	-0.00408 (0.0207)	-0.00763 (0.0388)
Federal Funds Sold	0.00326 (0.3365)	0.00550 (0.3194)	0.00656 (0.2268)	0.00499 (0.4704)
Other Assets	0.00389 (0.0094)	0.00371 (0.0082)	0.00525 (0.0036)	0.00542 (0.0516)
Total Loans	0.02851 (0.0004)	0.00325 (0.7497)	0.01507 (0.0580)	0.01100 (0.1639)

The two statistics are the mean change and its significance.

Source: Federal Reserve Bank of Atlanta

**Table 5.** Changes in Selected Funding Ratios  
From 1972-1977 to 1978-1981

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Equity/Assets	-0.01103 (0.0001)	0.00292 (0.0776)	0.00098 (0.5684)	0.00074 (0.6024)
IPC Demand Deposits Liabilities	-0.05045 (0.0001)	-0.05155 (0.0001)	-0.04644 (0.0001)	-0.03242 (0.0001)
IPC Time and Savings Deposits Liabilities	0.05907 (0.0001)	0.05828 (0.0001)	0.04359 (0.0001)	0.03154 (0.0009)
Federal Funds Purchased Liabilities	0.01183 (0.0004)	0.01165 (0.0066)	0.02541 (0.0019)	0.02469 (0.0002)

The two statistics are the mean change and its significance.

Source: Federal Reserve Bank of Atlanta

on its profitability. It also suggests that neither a bank's size nor the average market concentration it faces appears to affect profitability. The most profitable banks hold more securities, which reduces their non-interest expenses while earning the same revenue as more costly sources. They rely more on equity funding, which reduces their interest and non-interest expenses. They have more demand deposits, which reduces their interest expense. Finally, the difference between the most profitable and the less profitable banks'

non-interest costs is so large that variations in the banks' asset and liability portfolios cannot explain the difference. This suggests that the most profitable banks maintain better cost controls.

We found no evidence to support the hypothesis that changes in the banking environment have yet changed the primary factors that affect consistent bank profitability.

—Larry D. Wall

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Appendix

This study seeks to identify the primary determinants of bank profitability through statistical analysis of the financial ratios of selected banks. Most of the data in this article are taken from the Reports of Condition and Income that insured commercial banks file with the federal bank regulators. Data from the reports have been modified at the Board of Governors to reflect bank mergers.<sup>14</sup> The data on bank market concentration are taken from the Summary of Deposits data for every year from 1972 through 1981. The measure of concentration used is the average Herfindahl Index facing the bank, which is the sum of the squared market shares of the banks in the market. The average Herfindahl Index for those banks operating in multiple markets in this study is the weighted average of the Herfindahl Indices of all of the markets the bank operates in with the weights equal to the proportion of the bank's total deposits derived from the market.<sup>15</sup>

The banks in the sample were chosen by a two-step process: first a pool of banks with common characteristics was selected and then the banks with consistent profitability records within the pool were chosen for further analysis. The criteria for inclusion in the first pool were that the bank had to be unaffiliated with a holding company, between \$50 and \$500 million in assets in 1981, headquartered in an SMSA, a member of the Federal Reserve and could not have changed its charter class.<sup>16</sup> We divided this pool of banks into four equal sized groups based on their return on assets (the ratio of net income after taxes to total assets) in each of the 10 years. Those banks that fell into the same profitability quartile for seven of the 10 years and always fell into that quartile or an adjacent quartile were selected for the sample.<sup>17</sup> This sample selection singled out those banks that have demonstrated consistent profitability in a variety of economic conditions.

The statistical methods used in this study seek to identify the factor or factors that most influence bank profitability and to see if the factors have changed from 1972-1977 to 1978-1981. The important profitability factors are identified by regressing various bank ratios in every year on a set of quartile dummies, the bank's average Herfindahl, a measure of its size, a set of region dummy variables, and a set of year dummy variables.<sup>18</sup> The changes in the factors explaining bank profitability are explored in two ways: the bank ratio regressions are run for each of two sub-periods, and t-tests of the differences in certain bank balance sheet ratios between the two periods.

The regressions to identify the primary determinants of bank profitability are of the form:

$$C = a + Q * B_1 + H * B_2 + (100/A) * B_3 + R * B_4 + Y * B_5 + e$$

with

- C = a bank characteristic
- Q = a set of quartile dummy variables
- H = the bank's average Herfindahl
- A = the bank's total assets in 1972 dollars
- R = a set of region dummy variables<sup>21</sup>
- Y = a set of year dummy variables
- e = a random error term

The advantage of this multiple linear regression equation is that it controls for the various possible determinants of a characteristic so that the coefficient on each of the variables picks up only the effect due to that variable.<sup>22</sup> For example, if the tests looked only at bank profitability and size, and large banks were found to be more profitable one could not say that big banks *per se* were more profitable because large banks may be concentrated in the most prosperous regions of the country.

<sup>17</sup>The modifications attempt to match each bank's income with the assets used to produce that income.

<sup>18</sup>Bank markets are defined as the SMSA if the bank branch is in an SMSA otherwise it is defined as the county that the branch is in.

<sup>19</sup>The asset range of \$50 to \$500 million is arbitrary, but there are good reasons for excluding very small and very large banks from the study. The problems with including large banks is that they operate in a variety of regional and national markets and any measure of market concentration for these banks is suspect. Relatively small banks are not included because of the problems created by analyzing manager owned banks. These managers can take their profits out of their bank by paying

themselves low salaries and high dividends; or by paying themselves high salaries and low dividends. Thus even though two small banks may be equally profitable they can report different levels of income.

<sup>20</sup>For example, a bank that fell in the top 25 percent of the banks in seven of the ten years and which always fell into the first or second profitability quartiles would be included.

<sup>21</sup>The region dummy variables pick up some of the local market influences but will not capture all of these factors

<sup>22</sup>This method is similar to that used by Haslem (5) except that Haslem did not have a market concentration variable.