Bank Profitability and Bank Size

By Edward C. Gallick

The earnings performance of commercial banks varies widely from one bank to another. Some banks earn quite high rates of return, while others turn in low rates of return. A number of factors are believed to contribute to the variability of bank profits. They include differences in bank size, location, and structure as well as differences in asset portfolios, liability composition, and quality of bank management.

This article examines the extent to which bank size is associated with bank profitability. In contrast to earlier studies on this subject, which have tended to focus on current profit disparities among selected individual banks or among well-defined bank subsamples, this study considers the profitability of all insured commercial banks in the United States during the 21-year period 1954-74.[1] Systematic differences in bank profitability by bank size, therefore, are examined from a long-run perspective. Also, to gain a better understanding of the variability of bank profits, the major components of bank profitability during the period are identified and their movements investigated. In addition, four subperiods within the 1954-74 period are considered to better evaluate the representative nature of long-run trends in profitability.

AN OVERVIEW OF PROFITABILITY: 1954-74

The overall measure of bank profitability used in this study is the rate of return on capital, defined as the ratio of net income before taxes to total capital. Table 1 shows the rates of return on capital of all insured commercial banks in the United States by bank deposit size during the years 1954-74. As can be seen, there is considerable variability in the rates of return among deposit size groupings. Nonetheless, there is a distinct tendency for smaller banks to register lower rates of return on capital than larger banks, not only during particular years but also during the period as a whole.

Evidence of a positive association between bank size and bank profitability is depicted clearly in Chart 1. The chart shows the average rates of return on capital by banks classified according to deposit size for the entire 1954-74 period. Banks with deposits of less than $5 million, for example, had an average rate of return of 11.43 per cent—the lowest ratio of any bank size group. Then, as the chart shows, the average rates of return tend to increase as bank size increases. Banks with deposits from $5 to $10 million, $10 to $25 million, $25 to $50 million, and $50 to $100 million averaged pretax rates of return on capital of 13.97, 14.98, 15.27, and 15.20 per cent, respectively. Banks with deposits of more than $100 million, the largest banks, had an average rate of return of 15.71 per cent—the highest ratio of any group.

Components of Bank Profitability

Given the clear tendency for bank profitability to rise as bank size increases, it is useful to examine the components of bank profitability that contribute to this positive relationship. The components can be identified by reference to the definition of the rate of return on capital, which is the ratio of net income before taxes to total capital, as shown by the following equation:

1/See William F. Ford, "Profitability: Why Do Some Banks Perform Better Than the Average? An In-Depth Analysis." *Banking.* Vol. 76, No. 16 (October 1974). pp. 29-33; Dennis A. Olson. "How High Profit Banks Get That Way." *Banking.* Vol. 67, No. 5 (May 1975). pp. 46-58; Jean L. Valerius, "Bank Profits in 1974," Federal Reserve Bank of Chicago *Business Conditions,* July 1975. pp. 13-15; Marvin M. Phaup. Jr.. "Contrasts in 1974 Bank Profitability: Two Profiles." *Economic Commentary,* Federal Reserve Bank of Cleveland. August 18, 1975; and William C. Niblack, "Income and Expenses of Eighth District Member Banks," Federal Reserve Bank of St. Louis *Review.* Vol. 57, No. 8 (August 1975), pp. 20-23.

Table 1

RATE OF RETURN ON CAPITAL, ALL INSURED COMMERCIAL BANKS, BY BANK SIZE

Year	Millions of dollars					
	Less thon $5	$5 to $10	$10 to $25	$25 to $50	$50 to $100	More thon $100
1954	13.546	15.553	17.169	18.494	18.652	17.833
1955	12.495	13.868	14.374	14.721	14.854	14.757
1956	12.168	13.238	13.943	14.471	15.001	15.055
1957	11.996	13.239	14.277	14.699	15.450	16.409
1958	12.304	14.659	16.618	18.934	18.752	20.705
1959	11.983	12.486	12.973	12.581	12.678	13.128
1960	13.027	14.583	16.191	17.488	17.568	19.280
1961	11.900	13.864	15.179	16.577	16.996	19.535
1962	11.416	13.057	13.997	14.339	15.307	16.578
1963	10.686	12.528	13.211	13.473	14.294	15.625
1964	10.984	13.051	13.576	13.849	13.622	14.639
1965	10.233	12.371	13.044	13.534	13.268	13.845
1966	11.038	12.550	13.028	13.257	13.005	13.019
1967	11.508	12.808	13.387	13.968	13.599	14.449
1968	11.826	13.751	14.414	14.703	14.075	14.463
1969	11.719	15.243	16.380	16.256	16.033	15.910
1970	12.276	15.770	16.599	16.162	15.980	15.488
1971	11.046	14.986	16.216	15.560	15.470	14.486
1972	8.766	13.966	15.797	15.719	15.267	14.439
1973	9.713	16.118	17.265	16.839	15.281	15.069
1974	9.302	15.674	16.871	14.944	14.098	15.234
1954-59	12.415	13.841	14.892	15.650	15.898	16.315
1960-64	11.603	13.417	14.431	15.145	15.557	17.131
1965-69	11.265	13.345	14.051	14.344	13.996	14.337
1970-74	10.221	15.303	16.550	15.845	15.219	14.943
1954-74	11.425	13.970	14.977	15.265	15.202	15.712

NOTE: Rate of return on capital defined as net income before taxes divided by total capital account. Denominators for the 1969-74 period calculated horn all commercial banks. Ratios computed horn aggregate dollar amounts and expressed as percentages. Post-1968 figures not strictly comparable due to changes in reporting procedures introduced in 1969. The remaining discrepancies, however, are minimal.

SOURCE: Annual Report(s) of the Federal Deposit Insurance Corporation; Assets and Liabilities: Commercial and Mutual Savings Banks. FDIC; and report(s) of income and of condition submitted to the Federal Reserve System.

(1) Rate of return on capital $= \dfrac{\text{net income}}{\text{capital}}$

Since net income is definitionally equal to total revenues minus total expenses, the rate of return on capital can also be shown as follows:[2]

(2) Rate of return on capital $= \dfrac{\text{total revenues} - \text{total expenses}}{\text{capital}}$

To eliminate the effects of absolute bank size on revenue, expense, and capital measures, each is deflated by total bank assets. As a result, bank profitability can be analyzed in terms of its three major components:

(3) Rate of return on capital $=$

$$\frac{\dfrac{\text{total revenues}}{\text{assets}} - \dfrac{\text{total expenses}}{\text{assets}}}{\dfrac{\text{capital}}{\text{assets}}}$$

This latter formulation implies that a higher rate of return on capital can result from a rise in the revenue-assets component or from a decline in either the expense-assets or the capital-assets components.

The average revenue, expense, and capital components of bank profitability during 1954-74, classified by bank size groups, are shown in Chart 1. In examining the relationship of these compo-

2/Total revenues are defined as total operating income. Total expenses equal total operating expenses plus actual net losses on loans and securities minus provision for loan losses and interest paid on capital notes and debentures. Capital includes total capital accounts.

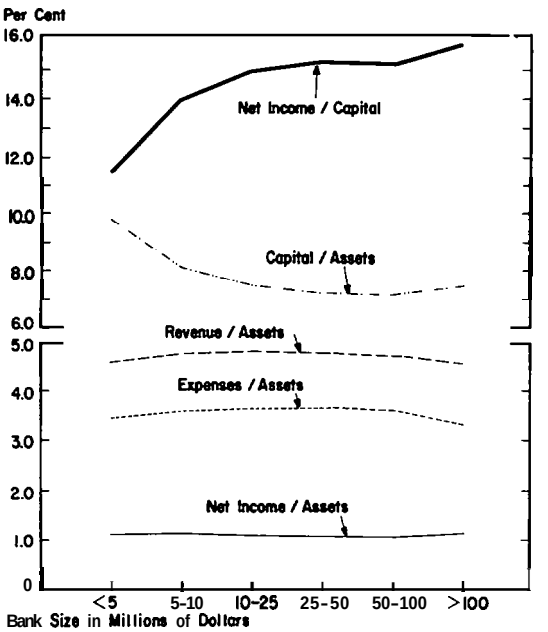
nents to bank profitability, it is quite evident from the chart that the uptrend in profitability across bank size is associated with the decline in the capital-assets ratio. The smallest banks—those with deposits of less than $5 million—had an average capital to assets ratio as high as 9.80 per cent. As bank size increased, the ratio declined quite sharply, falling to 7.17 per cent for banks with deposits of $50 to $100 million. The only exception to this generally strong negative relationship between profitability and capital to assets-occurred in the largest size group. These banks with deposits of more than $100 million increased their average return on capital relative to smaller sized banks despite an increase in their capital to assets.

The net income to assets component remained generally stable throughout the bank size distribution during the 1954-74 period. Banks withdeposits of less than $5 million averaged a net income to assets ratio of 1.12 per cent, while banks with deposits of $50 to $100 million had a ratio of 1.09 per cent. The largest banks, however, showed a noticeable rise in their net income component to 1.17 per cent.

The general stability in the net income to assets ratios shown in Chart 1 reveals a relatively constant spread between the revenue and expense ratios. Both revenue and expense ratios tend to increase across the smaller bank sizes and decline across the larger sizes. Banks with deposits over $100 million were able to reduce expense ratios sufficiently to offset lower revenue ratios, so that their net income relative to assets posted a noticeable increase.

The rise in the net income to assets ratio of the largest banks serves to explain how they were able to increase their overall profitability despite a rise in their capital to assets ratio. As indicated by equation (3), other things equal, an increase in the capital to assets ratio would cause a decline in the rate of return on capital. In the case of the largest banks, however, the rise in the net income component more than offset the negative impact coming from the capital component. Specifically, the higher rate of return on capital shown by the largest banks, relative to banks with deposits of $50 to $100 million, was due to a larger percentage gain (7.8 per

Chart 1
BANK PROFITABILITY: 1954-74



SOURCE: See Table 1.

cent) in the net income component than the percentage increase (4.1 per cent) in the capital component. The net effect of these two factors enabled banks with deposits over $100 million to earn the highest average return on capital of any bank size group for the entire period.

To summarize, the average rates of return on capital of all insured banks in the United States during the 1954-74 period have displayed a marked tendency to increase as bank size increases. For all but the largest size bank category, this tendency reflects systematic movements of two factors. The capital component of bank profitability declines as bank size increases and the net income component remains relatively constant. In the case of the largest banks, the increase in the rate of return on capital is produced by an upward movement in the net income component and not by a decline in the capital component.

How representative are these long-run trends in bank profitability, and components of profitability, for individual subperiods within the 1954-74 period? The next section of this article attempts to an-

swer this question by examining movements in bank profitability by bank size for four distinct subperiods.

PROFITABILITY WITHIN THE 1954-74 PERIOD

Representative Subperiods

The long-run systematic behavior of bank profitability across bank size is found to be representative of three subperiods: 1954-59, 1960-64, and 1965-69. To illustrate this similarity, Chart 2 contains average rates of return on capital for all insured commercial banks in the United States, grouped according to deposit size, for each of these subperiods. Also shown are the components of bank profitability for each of the subperiods.

A noticeable characteristic of each of the three representative subperiods is that the average rates of return on capital are positively associated with bank size. The smallest banks invariably record the lowest average rates of return; larger banks tend to show progressively higher rates of return; and the largest banks show the highest rates of profitability. Also clearly evident is that, for each representative subperiod, the capital to assets ratio fails across the size distribution, except in the case of the larger banks. There is, with the exception of the larger banks, a perceptible inverse relationship between bank profitability and the capital component in each of the three representative subperiods. The net income to assets ratio, and the underlying revenue and expense ratios, also behave in a similar fashion in each of the three subperiods. While little variability occurs in each of these ratios for most bank sizes, the net income to assets ratios of the largest banks rise noticeably due to a more rapid decline in the expense than in the revenue component. This rise in the net income component for the largest banks was sufficient to offset the increase in the capital component, producing a rise in the return on capital.[3]

A Nonrepresentative Subperiod

Movements in bank profitability are found to differ significantly in the 1970-74 subperiod from the long-run patterns evidenced for the entire 1954-74 period. Average rates of return for this nonrepresentative subperiod are depicted in Chart 2. As seen from the chart, rates of return on capital are only positively associated with bank size over the smaller bank groups. Thereafter, as bank size increases, profitability falls. As a consequence, the highest average rate of return of 16.55 per cent is turned in by medium sized banks with deposits of from $10 to $25 million. And, the profitability ratio of the largest banks of 14.94 per cent is found to be next to the lowest of any size group. In the 1970-74 subperiod, therefore, the relationship between profitability and bank size becomes negative for bank sizes larger than $25 million in deposits.

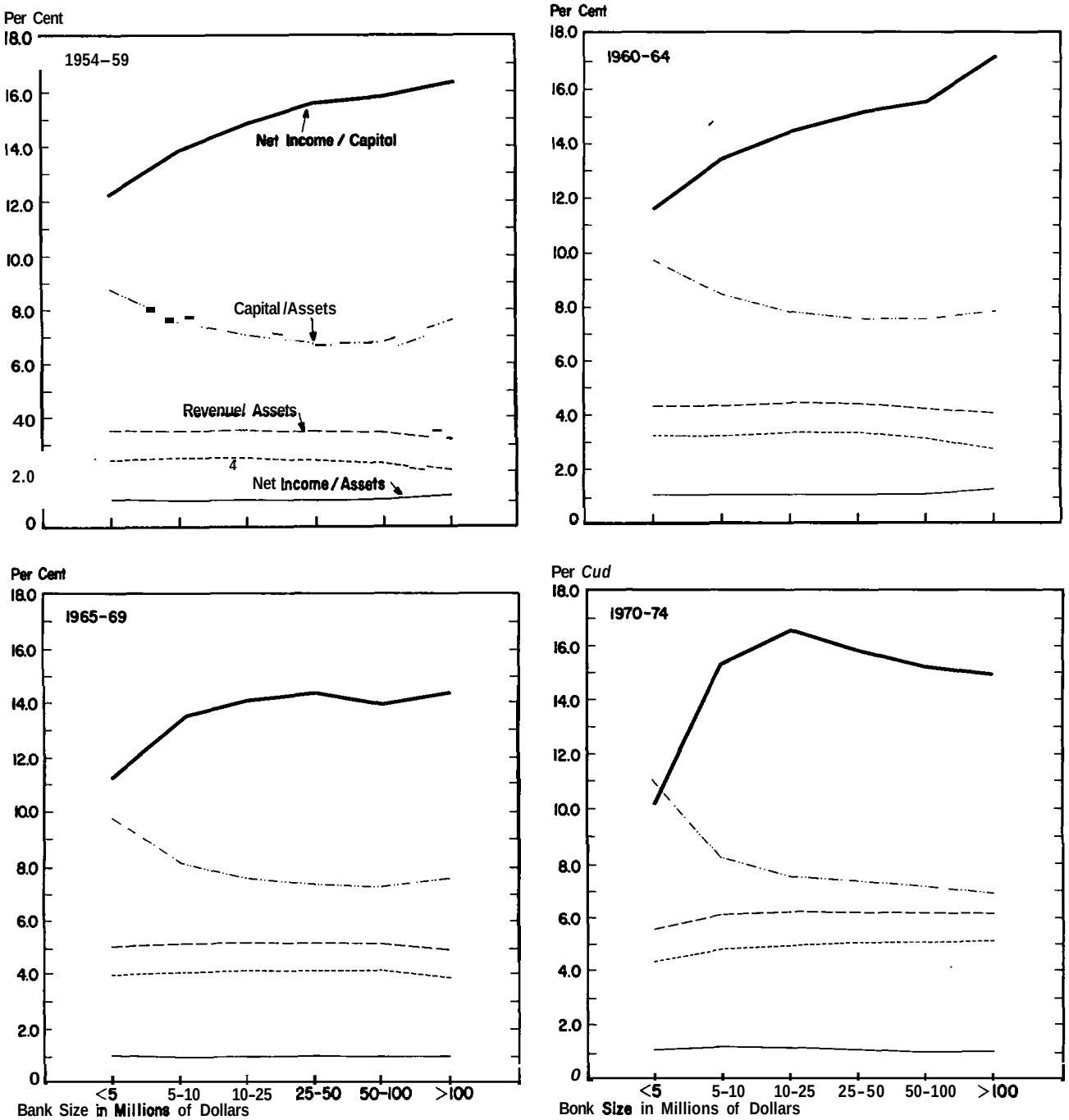
Movements in the capital to assets ratio in the most recent subperiod are generally similar to earlier periods for small and medium bank sizes. Unlike the 1954-74 period, however, the ratio falls across the larger bank sizes. Other things equal. declines in the capital component are associated with increases in bank profitability. Hence, declines in the capital to assets ratio across bank size offer no ready explanation for the relative decline in profitability experienced by the larger sized banks during the 1970-74 period.

The dominant factor contributing to the falloff in profitability at larger sized banks is that—unlike earlier periods—the net income to assets ratio drops almost steadily as bank size increases.[4] In particular, the ratio falls for the largest banks, which is in marked contrast to earlier subperiods when the ratio at these banks increased. Underlying the downward movement of the net income ratio, as seen in Chart 2, is the fact that the revenue component remains generally flat for all but the smaller bank sizes while the expense component steadily rises as bank size increases. This pattern is particularly evident for banks with deposits over $100 million. In brief, the decline in relative profit-

3/Chart 2 may appear to suggest that movements in capital are more important than movements in net income between the two largest bank sizes. Yet. in percentage terms, the increments in the net income component are larger. In the 1965-69 subperiod. for example. the capital to assets ratio increased from 7.28 per cent to 7.53 per cent. whereas the net income to assets ratio increased from 1.02 per cent to 1.08 per cent across the two largest bank sizes. In percentage terms, however, the movements in the capital and net income components are 3.43 per cent and 5.79 per cent, respectively.

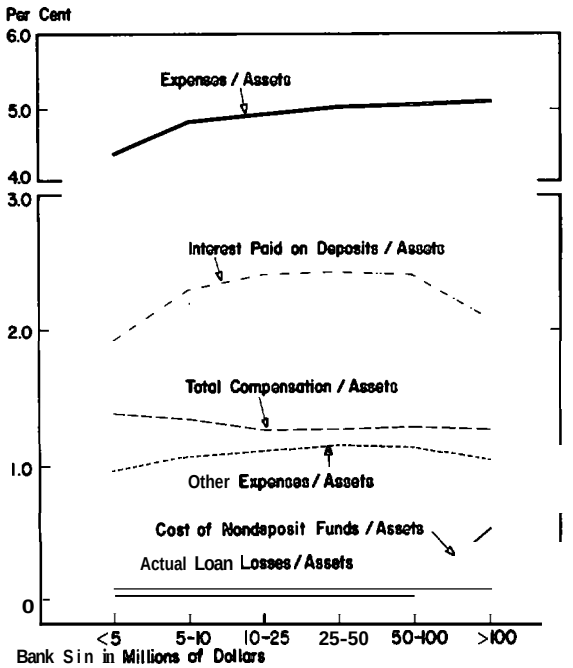
4/From equation (3). other things equal, a decline in the capital component produces an increase in the rate of return on capital. Thus, the downturn in net income was sufficient to reduce the rate of return on capital, despite the reduction in the capital to assets ratio.

Chart 2
BANK PROFITABILITY IN SUBPERIODS



SOURCE: See Table 1.

Chart 3
EXPENSE COMPONENT: 1970-74



SOURCE: See Table 1.

ability of the larger banks in the 1970-74 period is traceable to a rise in the expense component relative to the revenue component.

But what caused the expense component of bank profitability to rise at larger banks during the 1970-74 period? To examine this question, Chart 3 depicts the major items of expense relative to total assets of all commercial banks classified by deposit size during the recent period. The chart shows that all except one of the major expense items either declined or remained relatively constant over the larger bank size groups. The one expense item that increased noticeably was the cost of nondeposit sources of funds, defined as the expense of Federal funds purchased plus the interest cost on other borrowed money. In other words, the rise in the expense to assets ratio at the larger banks appears to be attributable mainly to an increase in the cost of nondeposit funds. Underlying this phenomenon is that the larger banks have relied increasingly during recent years on short-term borrowed money to accommodate loan demand in the short run and to maintain valuable customer relationships in the long run. These bank practices, however, at times of rising interest rates and unexpectedly severe inflationary pressures—such as prevailed in the 1970-74 period—undoubtedly have served to reduce the relative profitability of the larger sized banks.[5]

SUMMARY

An examination of bank profitability according to bank deposit size reveals that during the 1954-74 period there is a clear tendency for the rate of return on capital to increase as bank size increases. Small banks show the lowest average rates of return; larger banks show progressively higher rates of return; and the largest banks post the highest rates of profitability. Except for the largest bank sizes, this tendency reflects the sharp downward movement in the capital component of bank profitability as bank size increases. The net income component of bank profitability tends on average to vary little across small and medium sized banks. Across the two largest bank sizes, however, the income component increased sufficiently to offset an upward movement in the capital component, producing a rise in the rate of return on capital.

The general pattern of bank profitability observed in the 1954-74 period was found not to hold true in the most recent subperiod of 1970-74. Rates of return on capital were positively related to bank size only over the small to medium size groups. Thereafter, as bank size increased, bank profitability decreased. Consequently, medium sized banks turned in the highest average rate of return of any size group during the recent subperiod. Contributing to this pattern of bank profitability is that the expense component—particularly for short-term borrowed money—moved up quite noticeably at larger banks. As a result, the average profitability ratio of the largest banks was found to be next to the lowest of any size group during the recent 5-year period.

5/A mild and relatively stable inflation rare averaging 1.99 per cent per annum characterized the 1954-69 period; it more than tripled to 6.14 per cent during 1970-74. It is precisely in this time interval that rates of return on capital peak over the medium sized banks and steadily decline throughout the remainder of the bank size distribution.