

An Alternative View of Bank Competition: Profit or Share Maximization

A study of 590 banks over eight years finds consistent evidence that small banks seek to increase their market share even at the expense of profits. Large banks, on the other hand, apparently aim to maximize both profits and market share.

Market forces within the financial services industry are driving regulators and legislators to consider further deregulation. Both product and market restraints on financial institutions are being reconsidered seriously in light of new communication technology, product innovation, and cooperative competitive agreements among what traditionally were considered noncompeting financial institutions.

As deregulation removes the artificial restraints to product and market development, consolidations among financial institutions appear inevitable.¹ Although consolidations will occur, the degree of consolidation is questionable because there will always be a

place for relatively small financial organizations which are specialized and highly efficient. On one hand, consolidations may offer certain benefits, such as those associated with economies of scale and the consumer's ability to obtain many financial services from a single institution. On the other hand, consolidations may involve certain costs to society such as the potential loss in competitive market performance from the removal of some small and potentially innovative competitors.

Given the likelihood of deregulation and the probability that many small competitors will be eliminated through consolidations, it is essential to learn whether competition would be decreased if the number of small competitors were reduced. This study addresses the question by analyzing the competitive performance of relatively large and relatively small banks in the Sixth Federal Reserve District.

Conventional antitrust analysis is based on a traditional theoretical model that assumes a

¹To the extent that regulation has restrained the optimal size of financial institutions, deregulation will lead to mergers or consolidation among financial institutions. As deregulation occurs, a larger number of financial institutions will be able to offer similar financial services. This will tend to increase the number of competitors and reduce the level of market concentration, making it easier for similar institutions to merge.

firm's primary goal is to maximize profits. Given profit maximization as the firm's objective, it is then possible to depict the firm's conduct in various market settings. The firm's conduct or behavior then determines its performance (that is, prices, output, profit or rate of return). It follows that the interaction among firms in the same market, all attempting to maximize profits individually, will determine the market's competitive performance. Depicting all firms as profit maximizers then allows for a rather simple analysis of markets. Knowledge of the market's structure (number and size distribution of firms in the market) and the presumed conduct of firms in their efforts to maximize profits then allows us to project the market's competitive performance. Markets with high concentration (two or three firms controlling a relatively large portion of the market) are presumed to be less competitive (higher prices and lower levels of output) than those with low levels of concentration. This rather simple model forms the basis for the well-worn analytical tool that uses a market's structure to project its performance.

Casual Observation

Yet the competitive interaction among banks in market settings raises questions about the premise that all banks are profit maximizers. Commercial banks are department stores of financial services. The average consumer seems to develop a close relationship with his banker because access to future financial services may depend on it. This leads to customer loyalty perhaps unparalleled in other industries. Once people decide which bank to deal with, it is extremely difficult to persuade them to change. Consumer loyalty and mutuality of benefits appear to be at the root of this type of behavior. As a consequence bankers are less likely to compete for each others' current customers than for uncommitted customers. This is probably more the case for a small retail account than for large retail or commercial accounts. Competition for these latter types of accounts is probably more personal and individualized than competition for the small retail or small commercial account.

Two observations, then, seem worthwhile. First, most overt measures of competition within banking markets in fact measure the intensity of competition for relatively small

retail and commercial accounts. Second, these competitive actions are almost certainly directed at new customers, those just moving into a new area or seeking to establish a banking relationship. It is then primarily the growth in banking consumers for which bankers are overtly competing—not the entire customer base of a market.

This leads to a third and perhaps more important observation: small banks may emphasize deposit growth to a greater extent than do their larger competitors. Both large and small banks overtly compete for the same set of customers, but small banks have more to gain by attracting new customers than do large

"... if small banks are indeed the most likely to stimulate competition within a market, then the loss of small banks may weaken these markets' competitive performance."

banks. Numerous studies on economies of scale in banking show that significant reductions in average costs are experienced only up to approximately \$50 to \$75 million in deposits.² Past this point, as a bank expands its deposits it experiences relatively constant average costs. Therefore, by emphasizing deposit growth, the small bank may lower its average costs and thus increase its profit potentials. It follows that a small bank may undertake overt competitive actions (both price and nonprice) in order to attract proportionately more deposits than its larger competition. Only after the small bank has obtained a size sufficient to realize available economies of scale (lowest average costs) would it turn its attention to profits.

Now if we follow this line of reasoning further, we may hypothesize that relatively large banks and smaller banks in the same markets may have different objectives. The

²See George J. Benson, Gerald A. Hanweck and David B. Humphrey, "Operating Costs in Commercial Banking," this *Review*.

large bank may find it less desirable to compete overtly for market share than to simply take advantage of its customer base and maximize profits subject to some minimum market share constraint. On the other hand, the smaller bank finds it advantageous to expand its customer base in order to achieve sufficient size to take advantage of scale economies. Therefore, the small bank finds it advantageous to undertake overt competitive action to increase its deposit base.

To the extent that profit maximization behavior and share maximization behavior are inconsistent we should be able to devise an empirical test of the hypothesis. This hypothesis is important. If large and small banks in fact have different objectives, and if the small bank is most likely to undertake overt price and nonprice stimuli seeking to expand its market share, then the loss of many small banks may adversely affect the competitive performance of banking markets. In other words, if small banks are indeed the most likely to stimulate competition within a market, then the loss of small banks from deregulation and consolidations may weaken these financial markets' competitive performance.

Theoretical Rationale

Thinking of a firm as something other than a profit maximizer is by no means pathbreaking.³ In the late 1950s, W. J. Baumol asserted:

"I am prepared to generalize from these observations and assert that the typical oligopolist's objective can usefully be characterized, approximately, as sales maximization subject to a minimum profit constraint. Doubtless this premise over-specifies a rather vague set of attitudes but I believe it is not too far from the truth. So long as profits are high enough to keep stockholders satisfied and contribute adequately to the financing of company growth, management will bend its efforts to the augmentation of sales revenues rather than to further increase profits."⁴

Baumol's generalization was based on his view of how large firms actually behaved. The management of business firms seems to be obsessed with sales growth. In attempts to impress directors, attract stockholders or simply impress market observers, management consis-

tently emphasized sales growth. This led Baumol to hypothesize that the primary objective of the management of larger corporations is sales maximization subject to some minimum level of profits. This laid the foundation for a series of empirical studies attempting to verify what came to be known as the "sales maximization hypothesis." A number of these studies attempted to test the hypothesis, but most found little support for it.⁵ One exception, a study by Robert J. Saunders that used a cross section of commercial banks from the Fourth Federal Reserve District, reported:

"This observed profit-depressing, high growth-oriented behavior of some commercial banks would be expected in a situation where the sales maximization hypothesis is true . . ."⁶

More importantly, however, Saunders found that some commercial banks seemed to display profit maximizing behavior while others pursued policies consistent with sales maximization. Issues concerning the proper behavioral model for the firm clearly are far from settled as a number of recent articles on expense - preference behavior reveal.⁷

The predictability of the relationship between a market's structure (number and size distribution of firms) and its competitive performance (i.e. level of prices, profits, and output) largely depends on the objectives of firms in that market. The structure—performance relationship in banking has proved statistically significant but quantitatively weak. In other words, the level of market concentration (a structural measure of how much of the market is controlled by the largest firms) matters, but only very large changes in market concentration are associated with very small changes in price, profits or the other performance indicators. One probable reason for finding that this relationship quantitatively weak is that all firms in a market do not operate with the same objective. Numerous studies testing various explanations (for example, the expense preference hypothesis, or the

³F. Machlup, "Theories of the Firm: Marginalist, Behavioral, Managerial," *American Economic Review*, March 1967, pp. 1-33.

⁴William J. Baumol, *Business Behavior, Value and Growth*, (New York: Macmillan, 1959), pp. 49-50.

⁵See for example, William C. Pardridge, "Sales or Profit Maximization in Management Capitalism," *Western Economic Journal*, Spring, 1964; Marshall Hall, "Sales Examination" *Journal of Industrial Economics*, April, 1977; and Bevars D. Mabry and David L. Siders, "An Empirical Test of the Sales Maximization Hypothesis," *Southern Economic Journal*, January, 1967.

⁶Robert J. Saunders, "The Sales Maximization Hypothesis and the Behavior of Commercial Banks," *Mississippi Valley Journal of Business and Economics*, Vol 6, Fall 1970.

⁷See Stephen A. Rhoades, "A Summary and Evaluation of Structure-Performance Studies in Banking: An Update," Working Paper, Staff of the Board of Governors of the Federal Reserve System, 1982.

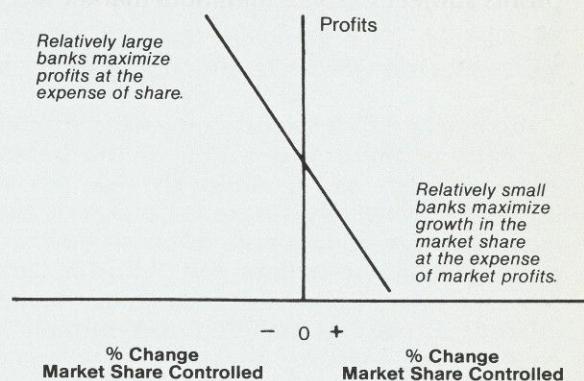
limit price hypothesis, or Hick's quiet life hypothesis or the linked oligopoly hypothesis) bear out the fact that the behavioral element especially of the banking firms is a complex animal.⁸ Attempting to understand a complex relationship often entails separating the components and analyzing them independently.

Since it is quite probable that not all firms operate with the same objective, a basic distinguishing characteristic should separate firms into groups sharing the same objective. Perhaps the simplest characteristic is the relative size of firms in their respective markets. For those markets chosen in the Sixth Federal Reserve District, banks with less than 3 percent market shares are consistently smaller than the deposit size necessary to take advantage of scale economies. Banks with more than 15 percent of the market's deposits are consistently larger than the minimum size necessary to take advantage of scale economies. Therefore, this study attempts to gather empirical evidence on the possibility that relatively large banking firms' behavior (those with fifteen percent or more of market deposit) differs significantly from that of smaller firms (those with three percent or less of market deposits) with respect to their profit and market share maximizing behavior.

Hypothesis

Our basic hypothesis is that relatively large banks attempt to maximize profit subject to some minimal market share constraint while smaller banks attempt to maximize market share subject to some minimal profit constraint. This hypothesis asserts that, in general, large banks are willing to sacrifice market share to take advantage of pricing or nonprice policies allowing the bank to maximize profits. Therefore, we would expect that higher levels of market profit would be associated with declining market share for large banks. Conversely, small banks are in general attempting to acquire market share, since increased market share equates to increased market power. It is only after the small

Figure 1. Graphic Depiction of the Hypothesized Relationship



bank has acquired some level of market power, or relative size, that its objective would change to maximizing profits. Therefore, we would expect lower levels of profit to be associated with increasing market share for small banks.

This would be expected if small banks have the same or higher but declining average cost as their larger competitors. It would not be expected only in the case where the average cost of the larger firm is higher than that of the smaller firm, in other words, where diseconomies of scale are encountered. Graphically, Figure I describes the relationship expected if the two sets of banks, large and small, in fact perform as if they were attempting to maximize profits or market shares, respectively. Conceptually, the relationship between profits and growth or decay in market share need not be continuous, but the general relationship described by Figure I would need to be found to support the hypothesis.

Sample

To test the hypothesis we selected banking markets in the Sixth Federal Reserve District that contained five or more banks in 1969.⁹ The criterion of five or more banks assures the inclusion of an ample number of both large and small banks. Because of the large number of

⁸See for example, Franklin R. Edwards, "Managerial Objectives in Regulated Industries: Expense-Preference Behavior in Banking," *Journal of Political Economy*, Vol. 85, February-December 1977 or Timothy H. Hannon, "Expense-Preference Behavior in Banking: A Reexamination," *Journal of Political Economy*, Vol. 87, February-December, 1979 or James A. Verbrugge and John S. Zahera, "Expense-Preference Behavior in the Savings and Loan Industry," *Journal of Money, Credit and Banking*, November, 1981.

⁹The geographic markets used were those defined by the Federal Reserve Bank of Atlanta and actually used in the analysis of holding company acquisitions or bank mergers.

banking markets in the Sixth District containing just two or three banks, inclusion of markets with less than five competitors would have artificially weighted the sample in the direction of relatively large banks. In total, 54 markets were selected which contained 590 banks in 1969.

Income and Call Report items were studied for each of these 590 banks for the period 1969 through 1977. Although this period includes a relatively severe recession, it also includes more normal periods of the business cycle. Overall we believe the period is fairly representative. Market shares and other market related calculations included new entrants in each of the markets; however, only banks existing in 1969 were used as observation points. These banks were segmented according to relative size, and the profit performance and share experience of each of these banks was tracked for the nine year period.

Model and Test

Given that this is an exploratory study, a direct test of the hypothesis proved too expensive to undertake. Statistical techniques to derive the appropriate share and profit constraints require tremendous amounts of computer time.¹⁰ Therefore, as a first approximation of the hypothesized relationship a test for differences in the actual profit and share performance of relatively large and relatively small banks was devised. This test is simply intended to establish whether or not relatively large and relatively small banks display the hypothesized patterns with respect to their profits and market share growth.

Since the exact point at which a bank would opt to maximize profits instead of market share was of little interest in this exploratory study, we simply split our sample into two segments based on the relative size of the bank within its relevant market. One segment included all banks with beginning (1969) market shares of 15 percent or more, i.e. our large bank segment. The second segment included all banks with beginning

¹⁰Ideally, to test the hypothesis in the form in which it is presented we would need a model in which a bank's market share and its profits are determined simultaneously. In addition, determination of the market share growth would require a profit constraint and determination of market profits would require a profit constraint. Maximum likelihood estimation may be used to identify the proper profit and share constraints, however, this procedure proved too expensive for the purpose at hand. Therefore, given that this is an exploratory study, an indirect test was devised in order to explore the relevance of the hypothesis without the elaborate direct test.

market shares of 3 percent or less, i.e. our small bank segment. This gives us two groups of banks, one relatively large the other relatively small. The profit or share growth objectives of banks in the mid-range (those with more than 3 percent of the market but less than 15) are more likely to differ among organizations than are the objectives of either the banks in the large or small bank groups. Therefore, an analysis of the relationship between bank profits and market share growth for banks in the large group relative to those in the small group should provide some indication of whether or not the two groups of banks perform as if they have significantly different objectives in conformity with the hypothesis.

The model used to gather empirical evidence took the following form:

$$\pi_{ij} = f(Ms_{ij}, Ab_{ij}, (DD/TD)_{ij}, R_{ij}, (C+I/TL)_{ij}, E Hc_{ij})$$

where:

$$\pi_{ij} = \text{Profits } = (\text{Net Income}/\text{Total Assets of the } i\text{th bank in the } j\text{th market.})$$

$$Ms_{ij} = \text{Change in the market share between 1969 and 1977 (Market Share 977 - Market Share 1969)}$$

$$Ab_{ij} = \text{Absolute size (Total Deposits in millions of dollars)) of the } i\text{th bank in the } j\text{th market in 1969.}$$

$$(DD/TD)_{ij} = \text{Average ratio of the } i\text{th bank's demand to total deposits from 1969 to 1977.}$$

$$R_{ij} = \text{a risk measure which is the bank's average loan-to-asset ratio over the period relative to the market's loan-to-asset ratio.}^{11}$$

$$(C+I/TL)_{ij} = \text{the proportion of commercial and industrial loans to total loans held by the } i\text{th bank in the } j\text{th market averaged for 9 years.}^{12}$$

$$E = \text{the number of new banks entering the market during the 1969 to 1977 period.}$$

$$H_j = \text{The average of the } j\text{th market's Herfindahl concentration ratios over the 9 year period.}$$

$$Hc = \text{a dummy variable which indicates whether or not the } i\text{th bank is a subsidiary of a bank holding company.}$$

$$^{11} R_{ij} = \frac{\left(\frac{\sum^9 L_{ij}}{T A_{ij}} \right) / 9}{\left(\frac{\sum^9 \sum^N L_{ij}}{T i A_{ij}} / N \right) 9}$$

$$^{12} (C+I/TL)_{ij} = \frac{9}{T} \left(\frac{C+I_{ij}}{TL_{ij}} \right) / 9$$

**Table. 1 Empirical Results on Relationship Between Profits and Share Growth for Large and Small Banks
(With Bank Profits the Dependent Variable)**

Classification of Bank Size	A Intercept	M_{sij}	A_{bij}	$(DD/TD)_{ij}$	R_{ij}	$(C+I/TL)_{ij}$	H_j	H_c	R^2	F	Cases
$\leq .03$ market share Small Bank	.008826	-.075266 (1.66) xx	.000483 (2.80) xxx	.001872 (1.59) x	.000413 (0.31)	-.009956 (3.22) xxx	.009440 (1.41) x	.000001 (0.88)	.07270	2.9903	275
$\geq .15$ market share Large Bank	.012025	.024150 (2.45) xxx	-.000013 (0.61)	.000280 (0.34)	.001700 (1.25) x	-.002370 (0.49)	-.004326 (0.50)	-.000017 (1.42) x	.19560	3.3348	104
$\leq .03$ or $\geq .15$ market share Large and Small Subset	.010708	.014973 (1.39) x	.000008 (0.38)	.001043 (1.35) x	.001607 (2.06) xx	-.006579 (2.66) xxx	.000102 (0.00)	.000001 (0.63)	.04841	2.6962	379
All Banks	.011252	.008887 (1.08)	-.000002 (0.09)	.001314 (1.78) xx	.000848 (1.44) x	-.007490 (3.83) xxx	-.000521 (0.13)	-.000001 (1.11)	.04372	3.8012	590

x = Significant at the .10 level.

xx = Significant at the .05 level – one tail t

xxx = Significant at the .01 level

Δ = F significant at the .01 level for all equations.

Given the hypothesis, we are interested in the relationship between the relative size of a bank and its profit and market share performance during the period. Specifically the expected relationship is:

Firm	Change in	
	Market Share	Profits
Small	>	<
Large	<	>

Therefore, we would expect the relationship between both small and large bank profits and changes in their market shares to be negative. Small banks would show lower profits as they gained market share and large banks would show higher profits as they lost market share. Since the signs of both share coefficients will not indicate whether or not the banks actually lost market share as profits increased (as we would expect for large banks) or gained market share at the expense of profit (as we would expect for small banks), a scatter diagram was used to differentiate the two events.

The expected signs on the remaining independent variables were as follows: profits are expected to expand with absolute size of the bank, (the larger the absolute size of the bank the more probable is profit maximizing behavior);

profits are expected to be positively associated with the banks' demand to total deposit ratio, (this ratio proxies the bank's cost of funds; therefore, the higher the ratio the lower the cost of funds, thus increasing the potential for higher profits); profits and risk are assumed to have a positive association, (as risk increases we expect higher returns); the proportion of the bank's loans allocated to commercial and industrial borrowers in a portfolio proxy which should be negatively associated with profits (commercial and industrial borrowers normally obtained preferred rates); the entry variable is expected to be positively associated with bank profits, the higher the level of bank profits the more attractive the market for new entrants; and, H_c or the holding company dummy variable is expected to be positively associated with bank profits (either because of deep pocket assumptions or potential economies associated with holding company organizational structure). The empirical results of estimating the model appear in Table I. As the table indicates, the model was run three times, once including only banks with 1969 market shares 15 percent or greater, once including only those banks with 1969 market shares of 3 percent or less, once including banks with either 3 percent or less of the market or 15 percent or more in 1969 and once for all banks.

The empirical results were mixed with respect to the hypothesis tested. The F test on all three

equations was significant at the .01 level. Each of the independent variables with significant (t) tests showed the expected conclusion except in the large bank category where both the change in market share and holding company affiliation variables showed signs opposite those expected. The relationship between holding company affiliation and profits for large banks was negative and significant at the .10 level. This would indicate that, at least for banks which are large relative to their markets, holding company affiliation is negatively associated with profits. This is an interesting finding but outside the scope of this particular study. The magnitude of the coefficient (.000016), however, is so small that although it is statistically significant, it is quantitatively very weak (a little over 1/10 of a percent).

The major unexpected occurrence was the relationship between profits and change in market share in the large bank category. As hypothesized, the relationship was expected to be negative, indicating that the greater the loss in market share the higher the profits. Instead, this relationship proved positive for large banks and significant at the .01 level. This surprisingly positive relationship indicates that, within the large bank category, the larger the loss in market share the lower the profits. To restate, the smaller the loss in market share or the larger the increase in market share the higher the profits. This relationship suggests that, at least for large banks in our sample, profit maximization and share maximization are not inconsistent objectives.

In order to get a visual picture of the relationship between changes in market share and profits, we ran scatter diagrams for both large and small banks. With the large bank category, scatters were run on all banks with 10 percent or more of market deposits, banks with 15 percent or more and banks with 20 percent or more of market deposits. The three groups all showed a significant positive relationship between change in market share and profits. Interestingly, as the criterion of bank size for each group increased—from a 10 percent market share, to 15 percent and then to 20 percent—the R^2 increased from .08 to .19 and the (t) values increased from 7.2 to 9.5. Those findings indicate that the relationship between changes in market share and profits became more predictable as the bank's market share increased in size.

Most importantly, however, two-thirds of all banks holding market shares of .10 or more in 1969 lost market share during the observation period. Three-fourths of the banks in the other large bank categories actually lost market share—those with market shares of .15 percent and greater, and those with 20 percent and more. In the large bank category, then, those banks that gave up smaller market shares during the observation period actually performed better in terms of profits than those that gave up more. In addition, larger banks that increased market share tended to enjoy higher profits than those showing declining market share. Therefore, it appears from this data that share maximizing behavior is not inconsistent with profit maximization for large banks.

For relatively small banks—those holding .03 percent or less of market deposits in 1969—there appears to be a tradeoff between share growth and profit growth. The hypothesized relationship between profits and change in market share for small banks is negative, and, as expected, the regression analysis shows a statistically significant negative relationship between change in market share and profits for this group. In addition, the scatter diagram of this relationship indicated that 82 percent of the small banks increased market share, contrasting sharply with the 75 percent of large banks showing decreases. The small banks' actual profit and share performance is consistent with the hypothesis that relatively small banks tended to emphasize share growth, accepting relatively small profits as they gained larger market shares during the period. Figure 2 compares the hypothesized relationship between profits and changes in market shares with the empirical findings.

The empirical relationship shows that the profit and market share performance of relatively small banks conforms to the hypothesis that profits and change in market share are inversely related. This same relationship was hypothesized for relatively large banks, but the empirical results show a positive relationship between the relatively large banks' profits and change in market share. In other words, as market share increases, profits increase. Therefore, small banks face a trade off between growth in market share and growth in profits which the large banks don't face. The large banks appear to increase profits by minimizing the market share loss or gaining market share.

Figure 2. Hypothesis Compared to Empirical Relationship of Large and Small Bank Profit Versus Market Share Experience

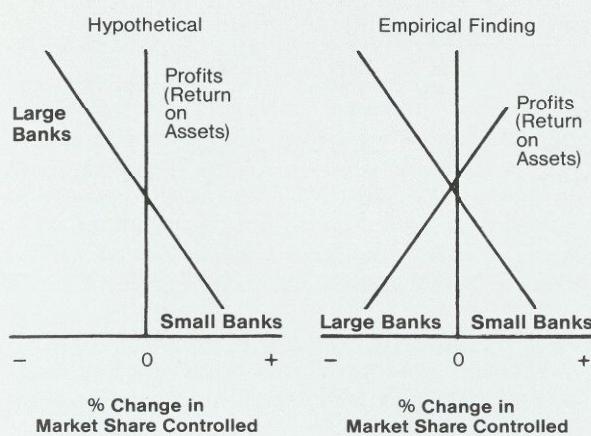


Table 2. Mean Level of Profits and Standard Deviation of Profits for Relatively Small Banks, Relatively Large Banks and All Banks.

	-1 Standard Deviation	Mean II	+Standard Deviation
Small Banks	.0046	.0103	.0160
Large Banks	.0066	.0110	.0154
All Banks	.0051	.0105	.0159

An analysis of the three equations presented in Table 1 indicates not only that the relationship between profits and changes in market share is significantly different for large and small banks but also that the model's ability to predict profit is reduced substantially when all banks are taken together (i.e. equation 3). Grouping the banks by relative share of the market increases our ability to predict market performance. This may be taken as another indication that the market behavior of large and small banks is significantly different. It also argues strongly for more research into the behavior of banks based on their relative market size.

In order to test the consistency of these findings with regard to market share performance we reorganized the variables in our model, allowing profits to become an independent variable and change in market share to become the dependent variable. Table III shows the results of rerunning the three equations.

The results of running the three equations a second time to evaluate market share are entirely consistent with the analysis of profit equation results. For relatively small banks profits were negatively associated with change in market share and statistically significant. Relatively large banks showed a statistically significant positive relationship between profits and change in market share. Relatively small banks tend to trade profits for increased market share and relatively large banks experience increased profits with increased market share. In addition the R^2 for both the relatively small bank sample and the large bank sample are higher than the R^2 for all banks taken together. This would again tend to indicate that small and large bank behavior is in fact different and that each group's behavior with respect to growth in market share is more predictable than all banks taken together.

Table 3. Empirical Results on Relationship Between Profits and Share Growth for Large and Small Banks
(With Change in Market Share the Dependent Variable)

Classification of Bank Size	A Intercept	Profits	Δb_{ij}	$(DD/TD)_{ij}$	R_{ij}	$(C+I/TL)_{ij}$	E	H_c	R ²	F	Cases
Small Bank .03 market share or less	-.0004	-.1338 (1.66) xx	.0010 (4.22) xxx	-.0006 (.35)	.0071 (5.12) xxx	.0020 (.46)	.0002 (2.35) xxx	-.0000 (.17)	.149	6.7	275
Large Bank .15 market share or greater	-.0308	2.4554 (2.53) xxx	-.0000 (.08)	-.0099 (1.22)	.0042 (.37)	-.0531 (1.16)	-.0034 (2.11) xx	-.0002 (1.57)	-233	4.2	104
All Banks	.0050	.2156 (1.04)	-.0005 (5.48) xxx	-.0095 (2.58) xxx	.0025 (1.00)	-.0174 (1.70) xx	-.0004 (2.23) xx	-.0000 (.89)	1.06	9.8	590

x = Significant at the .10 level

xx = Significant at the .05 level - one tail t

xxx = Significant at the .01 level

F = Significant at the .01 level for all equations.

A final note of interest, the entry variable is statistically significant in each of the three equations. Entry, however, is positively associated with growth in small bank market share and negatively associated with larger bank growth in market share. This, again, indicates that small banks compete effectively against their larger counterparts.

Conclusion

In testing the hypothesis that large banks tend to be profit maximizers and that small banks tend to be share maximizers, we come to the following conclusions. First, the tests were structured as an indirect test of the hypothesis, but the results indicate a statistically significant difference in the profit and change in market share relationship between large and small banks. A statistical test of significance (Chow test) indicates the coefficients in the equation for large banks are significantly different from the coefficients in the small bank equation. This is true for both sets of equations, the set predicting profits as well as the set predicting change in market share. This gives further evidence that the profit performance relative to market share performance is in fact different for large and small banks.

Our major finding is that the profit and market share performance of large banks is significantly different from that of small banks. Small banks

tend to experience a tradeoff between increases in their market share and profits, increasing market share at the expense of profits. Since the vast majority of small banks increased market share during the period, it appears they have a higher desire for share growth than do the larger banks, most of which gave up market share. On the other hand, our finding indicates that the relatively large banks do not experience a trade off between profits and growth in market share. To the contrary, it appears that relatively large banks may simultaneously maximize profits and market share. Given this difference and hence the probable difference in objectives of large and small banks, it is not hard to understand why the literature is full of studies that show such weak relationships between market structure and performance.

"Small banks tend to . . . increase market share at the expense of profits. . . [while] large banks may simultaneously maximize profits and market share."

Small banks show a higher propensity to acquire market share. Assuming that their actual performance represents an actual objective and not simply a mathematical necessity, small banks attempting to increase market share add to the competitiveness of the marketplace. But because large banks may undertake profit and share maximization behavior simultaneously and because the profit differential between large and small banks is so small, the competitive interaction of relatively small banks may retard the ability of large banks to acquire market share and hence profits. To this extent the consolidation of small banks into larger organizations may be detrimental to competition.

On the other hand, the fact that relatively large organizations may simultaneously maximize share and profits indicates that few organizations

in a market may be necessary to provide adequate levels of competition. Along the same line, because the differential in return on assets to relatively large and small banks is so slight, relatively small banks appear to be at little competitive disadvantage in relation to large banks. It follows that small banks may then feel little pressure to consolidate with larger organizations to compete effectively. By simply reducing their aggressiveness and attempting to maintain share, they can improve their return on assets.¹³

¹³The finding that large relatively large banks appear to simultaneously maximize share and profits is consistent with either increasing returns to scale or constant returns to scale in banking. The relatively small profits differential between relatively large and relatively small banks would argue strongly for constant returns in banking. This seems to be consistent with most of the empirical work on economies of scale in banking.

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REFERENCES

- Ballensperger, Ernst. "Alternative Approaches to the Theory of The Banking Firm" *Journal of Monetary Economics*, vol. 6, no. 1, 1980, pp. 1-37.
- Baumal, William J. "The Theory of Expansion of the Firm." *The American Economic Review*, vol. 52, 1962, pp. 1078-1087.
- Beighley, Prescott H. and Alan S. McCall. "Market Power and Structure and Commercial Bank Installment Lending." *Journal of Money, Credit, and Banking*, November, 1975, pp. 449-467.
- Benston, George J., Gerald Hanweck and David B. Humphrey. "Scale Economies in Banking: A Restructuring and Reassessment." Research Paper, Board of Governors of the Federal Reserve System, Washington, D.C., October, 1980 (Revised November, 1981).
- Edwards, Franklin R. and Arnold A. Heggestad. "Uncertainty, Market Structure, and Performance: The Galbraith-Caves Hypothesis and Managerial Motives in Banking." *Quarterly Journal of Economics*, vol. 87, no. 3, August, 1973, pp. 455-473.
- Glassman, Cynthia A. and Stephen A. Rhoades. "Owner vs. Manager Control Effects on Bank Performance." *The Review of Economics and Statistics*, vol. 62, 1980, pp. 263-270.
- Hall, Marshall. Sales Revenue Maximization: An Empirical Examination.
- Hannon, Timothy H. "Expense-Preference Behavior in Banking: A Reexamination." *Journal of Political Economy*, vol. 87, no. 4, 1979, pp. 891-895.
- Klein, Michael A. "A Theory of the Banking Firm," *Journal of Money, Credit and Banking*, vol. 3, May, 1971, pp. 205-218.
- Gale, Bradley, T. "Market Share and Rate of Return." *Review of Economics and Statistics*, November 1972, pp. 412-423.
- Mabry, Bevars, D. and David L. Siders. "An Empirical Test of the Sales Maximization Hypotheses." *Southern Economic Journal*, January 1967, pp. 367-377.
- McCall, Alan S. and Manfred O. Peterson. "A Critical Level of Commercial Bank Concentration." *Journal of Banking and Finance*, no. 4, 1980, pp. 353-369.
- Mullineaux, Donald J. "Economies of Scale and Organization Efficiency in Banking: A Profit Function Approach." *The Journal of Finance*, vol. 33, no. 1, March, 1978, pp. 259-280.
- Pardridge, William D. "Sales or Profit Maximization in Management Capitalism." *Western Economic Journal*, Spring, 1964, pp. 134-141.
- Rhoades, Stephen A. "Structure Performance Studies in Banking: A Summary and Evaluation." Staff Economic Studies No. 92, Board of Governors of the Federal Reserve System, Washington, D.C., 1977.
- Rhoades, Stephen A. and Paul Schweitzer. "Foothold Acquisitions and Bank Market Structure." Staff Economic Studies No. 98, Board of Governors of the Federal Reserve System, Washington, D.C., 1978.
- Saunders, Robert J. "On the Interpretation of Models Explaining Cross Sectional Differences Among Commercial Banks." *Journal of Financial and Quantitative Analysis*, March, 1969, pp. 25-35.
- Saunders, Robert J. "The Sales Maximization Hypothesis and the Behavior of Commercial Banks." *Mississippi Valley Journal of Business and Economics*, vol. 6, no. 1, Fall, 1970, pp. 21-32.
- Sealey, C. W., Jr. and James T. Lindley. "Inputs, Outputs, and a Theory of Production and Cost at Depository Financial Institutions." *The Journal of Finance*, vol. 32, no. 4, September, 1977, pp. 1251-1266.