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A CRITICISM OF THE TRADITIONAL
ANALYSIS OF BANKING COMPETITION

by

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Abstract

The conventional Structure-Conduct-Performance approach to the
study of banking competition has failed to produce the understanding
sought by bankers, students of banking, and policymakers. While
the unsatisfactory empirical results may derive, in part, from
inadequate data and improper statistical techniques--i.e., from
imperfect applications of the approach--the available evidence
suggests that they are explained instead by the fundamental defects
in the approach itself. In this paper we examine the conceptual
problems inherent in the traditional approach and suggest an alternative
line of inquiry which may be more fruitful.

A Criticism of Traditional Research on Banking Competition

Dale Osborne* and Jeanne Wendel**

> The shop seemed to be full of all manner of
> curious things. But whenever Alice looked
> hard at any shelf, to make out exactly what
> it had on it, that particular shelf was always
> quite empty.
>
> Lewis Carroll, Alice in Wonderland

Public policy toward banking competition in this country rests, as all public policy in every field must rest, on the assumptions, hypotheses, conventions, and selected empirical findings that constitute a conventional wisdom. In this case the conventional wisdom is that of the Structure-Conduct-Performance model of competition. It has two earmarks. First, competition in the sense of action, or competitive behavior, is conceptually distinct from--indeed, it is explained by--competition in the sense of conditions, or competitive potential. Second, competitive potential is a matter of concentration in the local market.

It is doubtful that competitive potential can be defined in a way that completely excludes behavior, since the actions of one bank must,

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to some extent, affect the conditions of other banks. Nonetheless, the conceptual divorce of competitive potential from behavior is not peculiar to S-C-P; indeed it seems essential to any model that can support utilitarian public policies in a more-or-less free society. The government of such a society cannot regularly order competitive behavior; it can only foster competitive behavior by creating and preserving its potential. It therefore needs a model that not only distinguishes between potential and behavior but also describes the former as causing the latter.*

The S-C-P model characterizes competitive potential in a particular way. It groups the country's banks into local markets and represents the conditions facing each bank by the concentration in its market (more accurately, in its markets, which might differ according to the service in question). It thus assumes that banks compete--or more often, collude-- with the banks in their market but with no others, and compete the less vigorously the more concentrated the market.

While the courts and regulators do not follow this approach slavishly, at some point in their deliberations on any proposed charter, acquisition, merger, or innovation they will consider the proposal's effects on local-market concentration. Indeed, they could hardly do otherwise, for S-C-P is the only model they know; it is what the students of banking competition have given them.

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*If public policy were (classically) liberal instead of utilitarian, it would aim at minimizing fraud and coercion instead of increasing social utility. Then, as it would be concerned with punishing the proscribed actions instead of fostering the prescribed ones, it would not require a model which defines competitive conditions to be strictly exogenous to actions.

In this paper we argue, first, that S-C-P has not worked; second, that its failure derives from defects in the approach itself rather than from imperfect applications of it; and third, that it distracts attention from the main issues.

The first point contradicts the conventional view that empirical research has uncovered a statistically significant effect of concentration on conduct and performance. It is true that the majority of published studies appear to show such an effect. A recent non-evaluative survey, for example, lists thirty-nine published studies of the relation between concentration and profits or prices, thirty of which report at least one relation that, though quantitatively small, appears to be statistically significant at the five percent level (Rhoades, 1977). In that survey, the 30/39 "success ratio" is interpreted as evidence of the basic validity and fruitfulness of the S-C-P approach. This interpretation is doubtful for two reasons. First, most of the surveyed studies present several tests of the concentration-performance hypothesis; that is, they employ several different concentration and performance variables and estimate several different forms of the relation between them. For instance, Stolz (1976) regresses ten different price variables on the Herfindahl index in three different ways (linear, cubic, and hyperbolic), thus actually testing the hypothesis thirty times; of these, only four show a statistically significant effect. This study--one of the more careful ones--more truly represents four "successes" in thirty "trials" than one success in one trial as tabulated by Rhoades. Second, empirical research is more likely to be published (and if circulated in working papers, noticed and remembered) if it reports a "success" than if not. For both reasons, it is premature to conclude that the percentage of "successes" falls outside the ninety-five percent confidence interval implied by the null hypothesis. The

conventional view very likely rests on a misleading impression of the empirical evidence.

Many workers in the field are aware of this possibility. Even those unaware of it tend to be uncomfortable about the quantitative insignificance of the apparently statistically significant effects of concentration. All, therefore, continue their efforts to perfect the application of the approach by improving the data, clarifying the notions of local markets and concentration, and refining the statistical techniques. These efforts might indeed pay off, for the existing work leaves considerable room for improvement.* But the meagre results thus far obtained must raise questions about the approach itself. These questions all point, we believe, to one conclusion: that it is time to reevaluate the theoretical underpinnings of S-C-P and explore alternative approaches.

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*See the evaluative surveys by Bentson (1973) and Osborne (1977).

The Supposed Support from the Industrial Studies

S-C-P originated in research on nonfinancial industries. Its apparent success in explaining cross-section variations in the profits of such industries is often regarded as ample justification for its continued use in banking research despite its poor performance there.* We must therefore digress for a moment to consider the results of S-C-P's interindustry applications.

Though it is now a conventional wisdom--a set of answers-- S-C-P began as an organizing framework for research, a source of questions: What are the most important dimensions of market structure and how can they be measured? what is the precise meaning of competitive conduct and to what extent is it observable? how are structure and conduct related? These were never thought to be easy questions but they were thought to be fruitful. S-C-P was thought, therefore, to constitute a useful research program.

A need for compromise, however, rapidly became apparent. As has often been observed, by economists more frequently than others, traditional economic analysis lacks a compelling theory--or even, some would say, a definition--of competitive conduct. Until very recently

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*Thus Rhoades speaks for many when he admits to "disbelief and frustration" at the repeated failures to find an appreciable effect of structure on performance, since "so many studies of the industrial sector have found a relatively large effect..." (Rhoades, 1977, p. 16).

it has been unable, for example, to say whether advertising is a species of such conduct or its opposite.* This theoretical gap combined with the trouble and expense of observing conduct to suggest a short cut: instead of conduct itself, researchers would deal with its putative results, which would then serve as indicators of conduct. The dominant line of research--the line most influential on antitrust policy--has found its prime indicator of conduct in profits, the assumption being that persistently high profits imply noncompetitive conduct. Thus the Structure-Conduct-Performance trio soon evolved into a Structure-Profits duo.

During this evolution, Structure underwent a similar transformation into Concentration. While entry conditions were not forgotten in the thinking about structure, they tended to be proxied by their putative effects on structure instead of being measured directly. Many honorable exceptions aside, the most influential line of research followed the assumption that the amount of successful entry into an industry would vary inversely with the height of its entry barriers. Hence an industry in which sales remained highly concentrated for a long time was, a _fortiori_, protected by high entry barriers. On such grounds it seemed possible to avoid the separate investigation of entry conditions and thus to represent an industry's structure solely by a measure of its concentration.

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*This did not keep the earlier S-C-P researchers from assuming advertising to be anticompetitive (mainly on the grounds that the perfectly competitive firm does not advertise). According to recent research, however, advertising is more often pro-competitive than not. See Ayanian (1975), for example.

These compromises result in the working hypothesis that high concentration causes high profits. To supply the hypothesis with content we must decide (1) how we should measure profits; (2) how we should define concentration, (3) what form of positive association between the two we should look for, and (4) what we mean by an industry. It is a serious defect that the hypothesis offers little help with these decisions. Yet its very flexibility has made it durable. When a particular specified relation between particular measures of profits and concentration in a particular defined industry failed to show up, one could blame the particularities and try another set of such.

The tenacious search for supporting evidence has been due largely to historical accident. In the earliest test of the hypothesis, Bain (1951) found a weak but statistically significant association between concentration and profits in a sample of 42 industries for the period 1936-1940. Probably because it was the first in the field, this study became very influential and its finding came to be accepted as truth. The several studies published soon afterward produced mixed results leading to no firm conclusions and leaving Bain's influence untouched. As late as 1971, Weiss could say that "practically all observers are now convinced that there is something to the traditional hypothesis." (Weiss, 1971, p. 371).

Recent results, however, undermine the hypothesis in a fundamental way. As the earlier studies supporting the hypothesis are reconsidered with larger samples, longer time periods, and, if appropriate, sounder statistical methods, two kinds of finding emerge.

First, most of the positive associations between concentration and profits vanish.* Second, those that remain fail, on closer inspection, to be consistent with the basic idea behind the hypothesis. This idea, it will be recalled, is that firms in concentrated industries can more easily coordinate their actions, by tacit or explicit collusion, to keep prices high and realize greater profits. If so, concentration should permit higher profits among firms of all sizes in the industry. Coordination, even if it were limited to the larger firms, would nevertheless shield the small ones as well. But Demsetz (1973) found that the remaining positive associations between concentration and profits hold only among the large firms, not the smaller ones. This pattern suggests that the above-average profits earned by the leading firms in concentrated industries generally reflect superior performance rather than collusion. Indeed, the superior performance might well explain the large firms' growth to dominance and hence the concentration of their industries. If this is so, concentration, far from leading to collusive behavior, actually emerges from competitive behavior. This position is argued forcefully by Peltzman (1977) and Brozen (1978) among others.

These findings are raising serious doubts about the conventional wisdom. Phillips (1976), for instance, recently concluded that we know very little about the relation, if any, between market structure and profitability. It is too early to say when the findings will penetrate the minds of legislators, regulators, and judges. But it is already too

*See, for example, Brozen (1974, 1975).

late to justify S-C-P's application to banking by its interindustry results. That application must stand or fall on its own merits.

The Crucial Role of the Local-Market Concept

Since the later and more careful interindustry applications of S-C-P had not yet appeared when serious research into banking competition began in the early 1960's, S-C-P seemed to be a natural organizing framework. In place of separate industries one had separate local markets for banking services but the analogy between them was obvious, and the concepts of structure and conduct in local banking markets introduced no additional problems. Indeed, these concepts seemed easier to handle in banking. Because entry is controlled by state and federal bodies, structure may more plausibly be identified with concentration; because public authorities collect so much information, the data on prices and services are obtainable cheaply enough that conduct need not be proxied by profits. In banking studies, therefore, Structure-Conduct-Performance rapidly took the form of Concentration-Conduct (or Concentration-Performance according to some investigators, who identify Performance with what we have been calling Conduct), and the traditional hypothesis is that banking services are more expensive in the more highly concentrated markets.

Regardless of the form in which it is applied to banking, S-C-P forces us to assume that distinct geographic markets exist for each banking service. By assumption, the banks in a given market compete for the business of the buyers located only within that market. Each

market must therefore be a self-contained unit. Since the structure of this unit determines the conduct and performance of the banks within it, a lot depends on our conception of structure. But no matter how appropriate this conception is, it will be useless if we fail to identify the market boundary.

S-C-P offers no help with the identification of local markets and does not indicate the types, if any, of nonbank financial firms that should be included in the market. These things have been handled in about as many ways in banking as in the industrial sector. But despite the generally poor results, the discussion tends to concern the particularities rather than the approach itself.*

Many investigators have identified banking markets with ready-made political units such as counties, towns, or SMSA's. The dangers of this practice are obvious, and the courts and regulatory authorities have tried to better it by using bank records to identify the geographic area in which a particular bank draws its customers. This approach ignores the potential customers who could be drawn to the bank by a more attractive price service package. Moreover, it cannot determine how many banks should be considered together in this manner. The resulting market areas are highly sensitive to the way in which this determination is made.**

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*Thus Austin's (1977) comprehensive survey of the issues in this field, while quite critical of many particular ways in which the approach has been carried out, never questions the validity of the approach itself.

**See Austin (1969) for a vivid demonstration of this sensitivity.

Probably the most attractive approach to defining local markets is that of Stolz (1976), who used economic and demographic data to delineate "areas of convenience" within which most local residents work and shop. Stolz assumed that these "areas of convenience" would be the relevant markets for a wide range of bank products and services, such as demand and time deposits, car loans, farm operating loans, and farm machinery loans.

This approach to banking markets can be tested statistically. If each market indeed represents a distinct group of buyers and sellers of a particluar banking service, its prices should be fairly homogeneous. Prices might differ between markets in response to intermarket differences in factors affecting supply and demand; but since such differences do not exist within a market (by definition), the dispersion of prices within markets should be small relative to the dispersion across them. An analysis of variance indicates, however, that this is the case for only a few of the 14 continuous price and service variables considered by Stolz.*

In other words, the variance within most of the markets is so large relative to the variance between them that the markets cannot be distinguished on the basis of individual price and service variables. Actual banking markets thus remain exceedingly difficult to identify.

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*For two variables in Iowa, three in Minnesota, and four in Wisconsin, the F-ratio was significantly large at the 5 percent level (see the appendix below for details). We are indebted to Stolz for the use of his data.

Problems Inherent in the Local-Market Concept

Things which remain elusive despite diligent search often turn out to be ill-defined or even nonexistent. That this might be the case with the concept of distinct local banking markets is suggested by three considerations. First, the concept of a local market implicitly rests on the assumption that locational convenience is of paramount importance to the consumer. It is implausible to assume concurrently that the importance of this factor ends at the market boundary. If location considerations prevent competition between markets, as S-C-P forces us to assume, they must also affect competition within each market. While this is partly a matter of structure (structural measures should depend on time or distance as well as the number and size distribution of banks*), it must make us wonder whether the conventional concept of a market is appropriate.

Second, in areas where population centers are not separated by large sparsely populated regions, the market boundaries must be somewhat arbitrary. Customers who are located near the boundaries could bank conveniently in either market. The competition between both markets' banks for these borderline customers blurs the distinction between the markets.

Third, it is difficult to believe that consumers care only about locational convenience. It is more reasonable to expect them to care about a variety of banking characteristics, of which locational

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*We are indebted to Alton Gilbert for this observation.

convenience is only one: business hours, prices, lending policies, etc.
If consumers are always willing to trade some locational convenience for,
say, a better price, one cannot establish a definite boundary around the
area in which a group of people will select a bank. That area depends,
in part, on the vigor of competition among the banks.

This feedback of competition on local market areas creates a
problem for the traditional hypothesis, which implies a one-way flow of
causation from market structure to competition and performance. Since
competitive behavior partially determines the market and hence the market's
structure, it cannot be explained solely by that structure. This
is the fundamental conceptual defect of the conventional Structure-
Conduct-Performance approach.

This conceptual defect could be of minor practical significance
if the effect of competition on markets and structure were negligible
compared to the effect of structure on conduct and performance. If that
were so, it would surely show up in the data. The failure of numerous
research efforts to detect a clear connection between market structure and
performance persuades us that it is not so. On the contrary, we conclude
that the practical difficulty of identifying markets issues from the
conceptual ambiguity of the market itself.

The Local-Market Concept is a Distraction

To see just how distracting the local-market concept is, let us
waive the above objections and assume that the market problem is solvable
in priciple. What does the problem look like from an abstract point of view?

We begin with a set X of banks--all the banks in the country--and wish to allocate them to subsets that correspond to local markets. Abstractly, then, the problem is to define a family of subsets of X.

We might believe that there are several families of subsets, corresponding to different banking services; the local market for farm loans, for example, might differ from that for time deposits. We might also believe that some of the subsets of a given family intersect, i.e., that a bank can belong to more than one market for a given service. Alternatively, we might believe that the subsets do not intersect, i.e., that they partition X. Whatever we believe to be true of the family, we must in any case assign banks to their appropriate subsets. If this assignment were always obvious, we would have a characteristic function f_M for each subset M: for each bank x,

$$f_M(x) = \begin{cases} 1 \text{ if } x \epsilon M \\ 0 \text{ otherwise.} \end{cases}$$

In words, if bank x belongs to market M then $f_M(x) = 1$; if not, then $f_M(x) = 0$. We can say, therefore, that if the assignment of banks to markets were never uncertain, each market would have a characteristic function whose range is {0,1}.

But of course the assignment will in many cases be uncertain. It will not always be obvious whether a particular bank does or does not belong to market M. A local market is therefore a fuzzy set[*]: in place of a characteristic function that takes values in the two-element set {0,1}, it has a membership function taking values in the

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*See Zadeh (1965).

closed interval [0,1]. If the membership function for market M is g_M, then $g_M(x)$ shows the degree of membership of bank x in the market. If x unquestionably belongs to M, then $g_M(x) = 1$; if x unquestionably does not belong to M, then $g_M(x) = 0$; if membership is questionable, then $g_M(x)$ is strictly between 0 and 1, being larger the more likely it is that x properly belongs to M. Hence the assignment of banks to markets is equivalent to the assignment of a membership number from [0,1] to each bank with respect to each market. This is the market-delineation problem considered abstractly.*

Without going into the particular factors that we would consider in choosing membership numbers in the uncertain cases, we think the general nature of those factors is clear. Suppose $g_M(x) = 1$; then in choosing a value for $g_M(y)$ we will have to consider the competitive forces between banks x and y. If these forces are strong, we will put $g_M(y)$ equal to 1 or close to it; if they are weak, we will put $g_M(y)$ equal to zero or near it. In other words, we can properly delineate local markets only if we can evaluate the competitive forces between banks. But if we can do this we can deal with competitive conditions

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*If we could solve this problem, we might use the solution in a regression analysis (for example) to multiply the individual-bank data by the value of the membership function. Thus, if $g_M(x) = 1$, $g_N(x) = .5$, $g_R(x) = .2$, and $g_T(x) = 0$ for all other markets T, then instead of using one observation vector for bank x in the regression, we would use three: the given vector with the structure of market M, one-half that vector with the structure of market N, and two-tenths of that vector with the structure of market R.

directly; we will not have to proxy them by some index of local-market
structure. Ironically, the more accurately we can delineate local markets,
the less we need the local-market concept. Market delineation, so
essential to S-C-P, distracts us from the main issues.

A Possible Alternative

Trying to solve a scientific problem (or indeed any problem)
is like trying to traverse a maze. Wherever we might be in relation to
our goal, we can proceed along any of several paths, each of which is
a potential blind alley. We must, therefore, constantly search for signs
that we have taken such a path. When the signs have accumulated suffi-
ciently we must abandon our path, however comfortably familiar it might be,
and set out on a new one. The abandonment of a blind alley is progress.
We therefore feel no compulsion to present, at this time, a fully developed
alternative to S-C-P. However, the following remarks suggest an approach
that may prove to be fruitful.

The essential idea behind the S-C-P approach is that competitive
potential affects behavior. The approach expresses this idea in a
particular form. That this form is unproductive does not mean that the
idea is wrong. What is wrong is the denial of tradeoffs between
locational convenience and other aspects of bank services, and thus
the denial of potential competition between banks in different "markets."

We might as well make a virtue of necessity and not only admit
but exploit the fact that, in some appropriate sense, all banks poten-
tially compete with each other. Instead of beginning with the extreme

assumption that the population of banks can be divided into subsets constituting local markets, it seems better to begin at the opposite extreme: all banks constitute one market, over which, however, competitive potential is distributed unevenly.

It is no objection that people tend to bank near their homes or businesses. Admittedly, distance and the associated transportation costs give banks an advantage over their distant rivals in attracting local customers, but they do not preclude competition between them. Any bank that tries to exploit its advantage too intensively will lose customers to distant rivals. The desire for profits will therefore lead the banks to protect the part of their business that is cheapest to protect--that of their local customers. Hence consumers tend to deal with the closest bank, not in _spite_ of the competition with distant banks but _because_ of it. That consumers tend to bank locally is, therefore, as consistent with the assumption of one market as with the assumption of many.

The one-market assumption acknowledges the importance of locational convenience but avoids the necessity of classifying banks as either convenient to a group of customers or not convenient. Rather, it suggests that any bank offering a sufficiently attractive product will become "convenient" to any consumer. Naturally, it will rarely pay distant banks to do this. Competition for more distant customers is more expensive.

Anything that increases the costs of competing for distant customers will obstruct the competition between distant banks and, therefore, permit competition to be less evenly distributed over the banking system. The branching limitations imposed by many states act

precisely in this manner. To gain some insight into their effects, we

have further analyzed Stolz's data. As mentioned above, only a minority of

his fourteen price and service variables took significantly different

values in different convenience areas. In Iowa, however, which

permits some branching in either the same county as the home office or a

contiguous county, and where only two variables differed significantly

between convenience areas, eight differed significantly between counties.[*]

In Wisconsin, which has only permitted limited branching since 1968,

four variables differed significantly between convenience areas and the same

four differed significantly between counties. In Minnesota, a unit

banking state, only three variables differed between convenience areas

and three also differed between counties.

In Iowa, competition is distributed more evenly within and less

evenly between counties than it is in the other two states because the

branching regulations do not so appreciably raise the costs of competing

within counties as they do in Wisconsin and even more so in Minnesota.

We believe, therefore, that competition is more adequately

viewed in terms of the strength of rivalry between banks than in terms of

the number of local options available to a specific group of customers.

Indeed, the number of options available to the customers should be viewed

as a by-product of the competitive forces acting on the banks in the

region. Some evidence supports this view. For example, Jacobs (1971)

found that while rates on business loans decline slightly with decreases

in concentration, they decline significantly with liberalizations of the

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*See the appendix for details.

branching laws. And when Horvitz (1968) calculated the dispersion in rates paid on time deposits and certificates of deposit in a number of geographical regions, he found it to be smaller the less restrictive the branching laws. Both patterns show that decreasing the costs of competing increases the strength of competition and evens out its distribution. Neither pattern can be explained by S-C-P.

The one-market assumption directs our attention away from the conventional framework's curious proxies for competitive conditions (concentration ratios, Herfindahl indexes, and the like) to a more direct consideration of competition itself, both in the sense of action (competitive behavior) and in the sense of conditions (competitive potential). Competitive behavior is the attempt to attract and keep customers; competitive potential determines how strenuous the effort must be and how successful it is. The meaning of competitive behavior thus suggests lines of inquiry into competitive potential.

The initial attraction of S-C-P was its apparent shortcut past that inquiry. Instead of a research program concerned with the measurement of competitive potential, it held out the apparently easier targets of delineating local markets and measuring structure. Experience proves that the apparent shortcut is a dead end. The one-market assumption suggests questions that, though more difficult to answer, go directly to the issues. It might even point us in the right direction.

Appendix

Analysis of variance allows us to evaluate an assignment of banks to putative local markets. Taking a given price or service variable, say the rate of interest on car loans, we compute the mean value of the variable in each market, the variation of these means about the overall sample mean, and the variation within each market. The variation of the market means about the overall sample mean measures the part of overall sample variation accounted for by differences between markets. The better the assignment, the larger is this part and the smaller is the part originating from variation within each market, which is, of course, wholly unaccounted for by the assignment. The F- ratio--the ratio of the former to the latter after both are divided by their degrees of freedom-- therefore permits an evaluation of the assignment. If the assignment is completely artificial, so that the putative markets are imaginary, the F-ratio will tend to 1. But the larger the F-ratio the harder it is to accept the null hypothesis that the assignment is artificial. If the ratio exceeds the critical value associated with a given level of statistical significance, say one percent or five percent, we reject the null hypothesis and conclude, with some risk, that the assignment is not completely artificial. To reduce this risk we perform similar analyses on a number of price and service variables and observe the proportion of them for which the null hypothesis is rejected. A large proportion of such rejections will incline us more favorably to the assignment, a small proportion will lead us to doubt it.

Table I presents the results of these analyses for all of
the continuous variables studied by Stolz. As the Table shows,
for only one variable is the F-ratio significantly large in all
three states; for two variables it is significantly large in two
of the three states. Of the total of 42 ratios computed for all
three states, only nine are significantly large at the 5 percent
level. In our judgment, this proportion is too small to rationalize
the market assignment.

Stolz's convenience-areas are not, of course, without economic
significance. The banks within an area tend to exert more competitive
potential on each other than on banks outside the area. Competitive
forces "pile up" in these areas and induce the banks within them
to compete more vigorously with each other than with banks outside
them. This is why some of the F-ratios are significantly large.
To check this reasoning, we performed a similar analysis of variance
on arbitrarily defined markets; that is, we randomly grouped the
banks of each state into 25 "markets" and computed the F-ratios as
above. As expected, none of the ratios were significantly large at
the 5-percent level.

We performed a similar analysis of a market partition determined
strictly by counties. Table II reports the results. Here considerably
more of the ratios are significantly large. This does not mean that
counties approximate the local markets postulated by the conventional
approach more closely than Stolz's convenience-areas do. Indeed,

Stolz's method would represent an appropriate procedure for obtaining such a local-market partition if the conventional market concept were valid. It is just that competitive potential tends to pile up in each type of "market," forcing some degree of homogeneity on the banks within it. However, the potential extends past both kinds of "market" boundary, and its effect on banks in other "markets" is a matter of more-or-less and not some-or-none.

Table 1

$\underline{F}$ RATIOS ASSOCIATED WITH STOLZ'S MARKETS

Variable	Iowa[1]/	Minne-sota[1]/	Wiscon-sin[1]/
Annual percentage rate paid on:			
Passbook savings	1.42	1.23	1.44
90-day deposits	.87	1.19	.58
One-year certificates of deposit	.84	1.13	1.38
Four-year certificates of deposit	1.34	.90	1.77*
Service charge on a standardized personal checking account	1.30	1.51	5.48**
Typical charge for a returned check	2.08**	2.32**	1.24
Annual percentage rate charged on:			
A 36-month-instalment new automobile loan ...	1.16	1.40	1.29
A standardized new farm machine loan maturing in three years	.86	1.50	1.23
A one-year farm operating loan secured by crops or livestock	1.18	2.74**	1.82*
Annual charge for smallest-size safety-deposit box	.86	1.08	1.54
Total hours bank is open for business:			
During week	1.17	1.28	1.08
On Saturday	2.75**	2.55**	1.81*
Monday-Friday during the core period (9:00 a.m. to 3:00 p.m.)	1.44	1.10	.97
Monday-Friday other than the core period	1.16	1.18	1.06

1. Iowa, 109 banks and 25 markets; Minnesota, 113 banks and 25 markets; Wisconsin, 111 banks and 25 markets.

* Significant at 5-percent level (the critical value is 1.66).

** Significant at 1-percent level (the critical value is 2.05 in Iowa and Wisconsin and 2.04 in Minnesota).

Table 2

F RATIOS ASSOCIATED WITH COUNTY MARKETS

Variable	Iowa[1]/	Minne-sota[1]/	Wiscon-sin[1]/
Annual percentage rate paid on:			
Passbook savings	2.29**	.80	.97
90-day deposits	1.31	1.14	.75
One-year certificates of deposit	.50	2.72**	1.07
Four-year certificates of deposit	1.33	.88	1.65*
Service charge on a standardized personal checking account	1.78*	1.54	2.60**
Typical charge for a returned check	2.26**	1.24	1.18
Annual percentage rate charged on: A 36-month-instalment new automobile loan ...	2.17**	1.15	.67
A standardized new farm machine loan maturing in three years	.59	1.09	1.49
A one-year farm operating loan secured by crops or livestock	.96	1.62*	2.38**
Annual charge for smallest-size safety-deposit box	1.23	1.20	1.48
Total hours bank is open for business: During week	1.64*	1.16	1.39
On Saturday	2.84**	2.93**	3.04**
Monday-Friday during the core period (9:00 a.m. to 3:00 p.m.)	1.70*	1.08	1.48
Monday-Friday other than the core period	1.76*	1.23	1.37

1. Iowa, 109 banks and 45 markets; Minnesota, 113 banks and 43 markets; Wisconsin, 111 banks and 40 markets.

* Significant at 5-percent level (the critical value is 1.58).

** Significant at 1-percent level (the critical value is 1.93 in Iowa and 1.91 in Minnesota and Wisconsin).

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