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On Competition In the United States  
Banking Industry

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Competition in the U.S. Banking Industry

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Is the market for commercial banking services national or do we observe significant price variation between different areas? If local markets for banking services exist, why? Are the price differences simply due to local differences in demand for these services or are they somehow related to differences in banking regulation? Most economists would agree that local banking markets exist but there is much less agreement about why. The objective of this paper is to examine this issue and, in particular, to assess the influence of regulation on prices of bank services.

Determining the major underlying causes for the existence of local markets will provide vital information to policy makers engaged in regulating banks. Historically, two generally accepted objectives have motivated banking regulation in this country: to insure the safety of the banking system and to maintain a competitive banking environment. Regulations governing branching, reserve requirements, interest rate ceilings, and asset and liability restrictions are generally considered to enhance bank safety, while laws regulating holding company acquisitions and bank mergers are used to promote competition. The impact of this regulatory environment has been unclear. It may have contributed to the stability of our banking industry, but at what cost? This study is an attempt to measure one possible cost of regulation--its impact on prices of bank services.

We address these questions through a two-part experiment. First we test the hypothesis that the market for consumer bank services is national by comparing the means of selected prices of consumer bank services across Standard Metropolitan Statistical Areas (SMSAs). Finding that they do, we then test whether differences between SMSAs can be explained by differences in state banking regulations. We do this by again comparing the means of prices of consumer bank services across SMSAs, but this time grouping the SMSAs by the degree of regulatory constraint.

The first section of this paper discusses several problems with the methodology in the literature. In sections two and three a more defensible methodology is presented and applied to a relatively new body of data on banking services. The final section discusses the policy implications of our results subject to a number of caveats related to the data set.

#### Critique of Previous Research

In recent years many studies have examined the effect of market structure and regulation on prices of banking services [1, 2, 4, 5, 6, 8, 11]. These studies have generally been empirically oriented with little, if any, explicit theorizing. Nevertheless, the model underlying the empirical work is clearly based on the theory of oligopoly. Each firm, or bank in this case, is assumed to have some control over the price it receives for its goods sold. The behavior that's modeled, then, is the price-setting strategy of the firm.

This strategy is usually expressed as a linear equation with price as the dependent variable and several explanatory variables. The

price a bank charges for a standardized commercial loan, for example, is assumed to depend on demand-related variables such as population and per-capita income in a market area; on market structure variables such as the degree of concentration in the market in which the bank resides or the size of the bank relative to other banks in its market; and on regulatory variables such as the type of branching permitted or restrictions on holding company acquisitions. Market areas are usually defined on the basis of data availability.

The rate-setting equation is then estimated using ordinary least squares. Significant  $R^2$ 's are interpreted as an overall test of the theory--as identifying a price-setting equation--while individual t-scores and the size of coefficients are interpreted as testing the causal importance of the explanatory variables. Most studies have found significant  $R^2$ 's and significant but relatively small effects from market concentration. They conclude that a ceteris paribus change in concentration will have only a marginal effect on price.

We have several objections to this approach. First, since oligopoly theory says nothing about the functional form of the firm's behavioral equation, a statistical technique should be used which requires a minimum amount of a priori restrictions. So, analysis of variance or chi square is preferred to linear regression. Second, although oligopoly theory has yielded few testable implications, one important result that has emerged is that in an oligopolistic market, the price a firm charges, the quantity it sells, and hence ultimately its market share and the degree of concentration within its market are simultaneously determined. Many explanatory variables typically found

in a price-setting equation, therefore, cannot be considered exogenous and such an equation estimated using ordinary least squares cannot be interpreted as identifying a behavioral equation with causal implications; at best it merely represents some interesting correlations.

Our last objection to this approach is that a sharper test of the null hypotheses exists but is rarely performed.<sup>1/</sup> In order to test the influence of market factors on the price-setting behavior of the firm, a market area must be defined. Typically a convenient geographical area such as an SMSA, county, or state is chosen with the caveat that a better definition of the market probably exists but is hard to find and beyond the scope of the study. These studies then test the joint hypothesis that the market has been correctly identified and that structure or regulation matters. But not being able to reject the null may only mean that the market has not been properly defined. A more direct test of these hypotheses is to first ask whether prices are significantly different between the designated market areas. And if they are, to see if these differences can be explained by variations in market factors.

#### Test of Local Banking Markets

An economically meaningful definition of the market that is well established in the literature and that provides a test of local markets is that prices within a market are uniform.<sup>2/</sup> If the price of a good is the same everywhere, then only one market exists--the national market--and there is nothing to explain. But, if differences in prices occur between geographical areas such as states, counties, SMSAs, or any other concept of what represents a local market, then that is evidence that local markets exist.

Accordingly, we test the null hypothesis that prices are equal across SMSAs. The main justification for this choice is that regulations vary across SMSAs so if prices do too, policies and price variations may be related. Another reason is that even though several studies on bank structure and competition use this designation, it has never been explicitly tested. Finally, there is the practical consideration that market data are available on the SMSA level.

The null hypothesis, of course, can be tested on any geographical subset with the same conclusion: If the null hypothesis is rejected, that geographical area represents an economically meaningful definition of a local market. To assess the impact of regulation on prices, however, whether the SMSA is the best representation of a local market (provides the largest significant difference between means) is not important.<sup>3/</sup>

The prices used in this study are for a set of consumer banking services, including passbook saving rates, new car loan rates, service charges (including cost of blank checks) on demand deposit accounts, charges for NSF checks, and charges for the least expensive safety deposit box. Because banking regulations such as the prohibition of interest payments on demand deposits suggest that banks compete in nonprice services, we also include the number of banking hours per week and the availability of overdraft credit, conventional mortgage loans, trust services, and 24-hour automated banking.

The data come from a 1973 telephone survey by the Board of Governors to assess competition in the provision of consumer banking services in 69 SMSAs where holding company or merger applications were expected soon. Within each SMSA a random sample of five banking offices

was made subject to the constraint of no more than one office from each banking organization in the SMSA. A total of 332 banking offices were sampled.

These data are a significant improvement over data used in many structure studies. They represent explicit prices, not implicit prices constructed from bank balance sheets and income statements. And, as mentioned above, they contain observations on nonprice variables which are presumed to be more important in highly regulated industries such as banking.

The data do have some obvious deficiencies, however. The observations are not random since SMSAs that might be undergoing structural change were picked. The sampling procedure also did not account for quantity sold.<sup>4/</sup> And the number of SMSAs surveyed was very small which *constrains the scope of our testing.*

The model underlying the test of the null hypothesis is a standard one-way analysis of variance. Because the analysis of variance is not appropriate for a comparison of means when both left- and right-hand side variables are qualitative, we use a chi-square test when we have qualitative dependent variables.

The results of our test are in Table 1. For each quantitative price variable it shows the corresponding  $R^2$  expressed as the percent of variance between SMSAs (explained variance) to total variance, and the F statistic. The chi-square statistic is given for the binary price variables. All price variables except the provision of 24-hour automated banking differ significantly across SMSAs. Thus we reject the null hypothesis and conclude that the SMSA is an economically meaningful representation of a banking market. In the next section we try to explain why prices differ across SMSAs.

Explanation of Price Differences Across SMSAs

Our purpose is to identify a priori exogenous market variables and particularly those regulatory variables that will explain differences in prices between SMSAs. The specific experiment we conduct consists of testing the null hypothesis that the means of prices of banking services are equal across SMSAs when the SMSAs are grouped to reflect differences in the explanatory variables. Thus, a rejection of the null hypothesis for any explanatory variable will imply a causal relationship.

The choice of explanatory variables reflects two considerations. First, our theories of firm behavior either imply many market factors are not explanatory variables; or if they are, they have to be considered endogenous. This constraint, in our view, rules out such variables as market concentration and average bank size within a market. Second, the limited number of SMSAs in our data set requires that no more than three dichotomous explanatory variables be used in our model in order to avoid empty cells. We tried to discard, therefore, only exogenous explanatory variables which were orthogonal to those included in the analysis.

Given these constraints we select as explanatory variables two state regulations--branching and reserve requirements--and one market-demand variable--population of the SMSA. Because some SMSAs in the data set encompass more than one state, we assign the SMSA to that state accounting for at least 70 percent of the SMSA's population. Two SMSAs did not meet this criterion and were deleted from the data set. With respect to the branching variable, the states are classified as either unit banking or all other. The resulting distribution is 24 unit-banking SMSAs and 43 all other SMSAs. As for the reserve-requirement variable, a quantitative measure is calculated for each state and



assigned to the respective SMSAs.<sup>5/</sup> The SMSAs are then ranked and divided into two categories--high and low--with an equal number of SMSAs in each cell. The SMSAs are similarly classified with respect to the population variable.

The dependent variables used are the quantitative price and nonprice variables that were shown to be significantly different across SMSAs.

The model we use for testing the equality of means is a regression model with binary regressors.<sup>6/</sup> This approach is equivalent to a three-way analysis of variance but has the advantage of testing the significance of the difference in means attributable to each explanatory variable. Moreover, it provides a quantitative measure of the difference in means between classifications of an explanatory variable ceteris paribus.

Results of the regressions are summarized in Table 2. It shows that the F statistic was significant at the 5 percent level for all the regressions except NSF check charges. The R<sup>2</sup>s were uniformly low indicating that the explanatory variables didn't explain much of the difference in means.

The branching variable was highly significant with respect to passbook savings rate and new car loan rate. Ceteris paribus, banks in SMSAs in unit-banking states offered 11 basis points more on savings deposits and charged 46 basis points less on new car loans than did banks in nonunit-banking states. The reserve-requirement variable was significant for three variables. Banks <sup>in SMSAs</sup> in high reserve-requirement states offered 5 basis points more on savings deposits, charged 20 cents more per month for checking accounts services, and were open nearly two hours

less per week than their counterparts <sup>in SMSAs</sup> in low reserve-requirement states. Population was also significant with respect to three variables. Banks in high-population SMSAs offered 7 basis points more on savings deposits, charged 23 cents more per month for checking account services, and charged 51 cents more per year on their least expensive safety-deposit box than did banks in low-population SMSAs.

#### Conclusion

We view the results presented in Tables 1 and 2 as being preliminary. Because the sampling procedure was not strictly random, because only 5 banks per SMSA were chosen, because the sample was limited to 69 SMSAs, and because prices and not quantities were sampled, our methodological approach applied to this body of data can be seriously questioned.

With a better sample, however, we think the approach is defensible. Moreover, since we used the best data available, the results are at least suggestive even though they must await more observations for confirmation.

## Footnotes

<sup>1/</sup> [3].

<sup>2/</sup> [10].

<sup>3/</sup> For an attempt to find the best definition using the uniform price criterion see [9].

<sup>4/</sup> If the sample were weighted in some way so as to capture quantity sold, we would expect a large reduction in variance but little change in means; thus, under our methodology it is harder to reject the null hypothesis.

<sup>5/</sup> The calculation of an aggregate reserve-requirement number for each state is based on information contained in Federal Reserve Bank of Kansas City, Monthly Review, April 1974. Our calculation assumes the following: (1) aggregate reserve requirements are weighted 50 percent to demand deposits, 25 percent to savings deposits, and 25 percent to time deposits; (2) only reserve requirements that are required to be held in vault cash or due from banks are included; and (3) where reserve requirements on demand deposits varies with size, the number used is that for deposits between \$10 and \$100 million.

<sup>6/</sup> See [7] pp. 409-430.

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Table 1  
 Test of Equality of Banking  
 Prices or Availability of Services Across SMSAs

<u>Price or Availability of Service</u>	<u>Percent of Variance Explained</u>	<u>F</u>	<u>Chi Square</u>
Passbook savings rate	52.1	4.19*	
Charge for NSF check	49.0	3.71*	
Checking account service charge	61.6	6.20*	
New car loan rate	52.1	4.20*	
Minimum charge for safety deposit box	30.0	1.65*	
Weekly hours open	43.1	2.92*	
Overdraft credit availability			95.59*
Conventional mortgage loan availability			163.61*
24-hour automated banking availability			60.13
Trust service availability			114.98*

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\* Significant at the 1 percent level.

Table 2

## Impact of Regulations on Prices and Availability of Banking Services

<u>Independent Variable</u>	<u>Dependent Variable</u>					
	<u>Passbook Savings Rate</u>	<u>NSF Check Charge</u>	<u>Checking Account Charge</u>	<u>New Car Loan Rate</u>	<u>Safety Deposit Box Charge</u>	<u>Hours Open</u>
Unit banking	.11**	-.29*	.15	-.46**	.01	-1.06
State reserve requirements	.05*	-.00	.20*	-.11	-.28	-1.92**
Population	.07**	.09	.23*	-.09	.51*	.86
F	12.73**	1.70	4.03**	7.63**	3.08*	4.00**
R <sup>2</sup>	.11	.02	.04	.07	.03	.04
<u>Sample Statistics</u>						
Mean	4.49	3.31	1.45	9.90	5.07	33.61
Standard Deviation	.22	1.14	.91	.91	1.72	6.05

\* Significant at 5 percent level.

\*\* Significant at 1 percent level.