

Some Conjectures on Bank Structure,
Performance and Its Relationship
to Agricultural Lending

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SOME CONJECTURES ON BANK STRUCTURE, PERFORMANCE
AND ITS RELATIONSHIP TO AGRICULTURAL LENDING

The term "small rural unit bank," which figures prominently in the current debate over banking structure, is a composite of structural characteristics which includes economic size, form of organization or ownership, and the market environment within which the bank operates. These characteristics, by implication, are thought to influence the competitive behavior and performance of the bank. This report reviews some of the theoretical considerations that underlie the relationship between economic structure and performance and their application to agricultural lending.

The influence of market structure on market performance is well established in economic theory. Conventional price theory seeks to explain the economic behavior of a firm or set of firms through a series of assumptions concerning technical production relationships, consumer behavior, producer motivation and the structure of the market in which the firm sells.

The structure of the market is defined as the summation of the organizational characteristics that influence the relations between and among actual and potential participants in the market. As Bain puts it "...market structure for practical purposes means those characteristics of the organization of a market which seem to influence strategically the nature of competition and pricing within the market."¹/ Generally speaking, markets with large numbers of competing firms, little size concentration, substitutable

¹Joe S. Bain, Industrial Organization, John S. Wiley and Sons, Inc., 1959.

products, and freedom of entry are considered to be relatively competitive. Conversely, markets that have few large firms, dissimilar products, and restricted entry are considered to be departures from the competitive norm.

Firms adapt to market structure in a variety of ways. Given a market structure a firm establishes a pattern of behavior or conduct that involves pricing policies, the determination of output levels and varieties of output, the forms and extent of non-price competition, and the method of reaction to the policies of competitors. The end result of the market structure and the pattern of conduct is termed market performance. For individual firms or industries, market performance is frequently measured in terms of price and profitability variation, productive efficiency, innovation, product characteristics such as quality and variety, and the use of non-price methods of competition. These measures of performance reflect the adjustment of a seller to effective demand for a given product.

The theory of market structure has been adapted and applied to the commercial banking system in several studies in recent years although little of the research has been directed toward agricultural lending. The results of the research, however, do present inferences that can be extended to the farm credit function of banks. With that in mind we will proceed to a review of the literature concerning banking structure and performance and present some conjectural ideas on how agricultural lending may be influenced.

Bank Size, Economies of Scale and Performance.

The economic significance of bank size has been a major topic of interest given the goals of public policy. Among the most important of these goals are the maintenance of competition within the banking sector, the achievement of an efficient allocation of resources, and the assurance of solvency of the system. Given the possibility of economies of scale

within the industry these goals are not necessarily compatible. Attempts to resolve this issue have led to several studies of the relationship between bank costs and size.

The existence of economies of scale in banking has been a generally accepted attribute of the industry. Such acceptance is based on arguments with considerable intuitive appeal. It is frequently assumed that bank costs decline with size of bank due to greater efficiencies in transactions and to greater expertise in various bank functions as banks expand the scope of their operations. A major problem in empirically testing this hypothesis, however, is the determination of appropriate measures of bank output.

The early studies of bank costs typically used some measure of earning assets (loans plus investment) or deposits as a measure of bank output. Alhadeff's bank cost study of 1954 is perhaps the classical example of this approach.^{2/} In his study, Alhadeff derived cost curves by relating operating expenses to both total earning assets and total deposits. The results of his study indicated that per unit costs declined sharply for bank sizes up to \$5 million deposits, remained relatively constant from that point to about the \$50 million deposit size, and then exhibited another decline. More recent studies using different statistical techniques although still employing total deposits as the output measure, generally found significant economies in all bank sizes up to the \$10 million level with a fairly large range of constant costs, or slight decreases in costs,

²Alhadeff, D. A., Monopoly and Competition in Banking, Berkeley University of California Press, 1954.

among the larger size banks.^{3/}

The use of balance sheet items as measures of bank output have several shortcomings. By defining output in this way banking functions are limited to lending as the primary productive activity and implies that all forms of bank credit are homogeneous. The use of a single value output measure obscures other aspects of the economic functions of a bank. These and other concerns about the validity of balance sheet measures led to a second approach in the analysis of economies of scale in banking.^{4/} In these studies the various bank functions or output were specifically defined and appropriate output measures were applied and analyzed.^{5/} This approach viewed a bank as a multi-product firm with a variety of production functions and cost curves, a view which is probably more characteristic of the economic nature of a bank than a unidimensional view. Unfortunately, the multi-product approach does not lead to a single output measure that can be used to generalize the economic efficiency level for a bank taken as a unit. For the most part, however, these later studies have found evidence, to one degree or another, of economies of scale for many of the various output

³For example see: Paul M Horvitz, "Economies of Scale in Banking," Private Financial Institutions, Commission on Money and Credit, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1963; I. Schweiger and J. McGee, "Chicago Banking," Journal of Business, XXXIV, July 1961; S. I. Greenbaum, "Competition and Efficiency in the Banking System -- Empirical Research and Its Policy Implications," Journal of Political Economy, August 1967.

⁴See Bernard Shull and Paul M. Horvitz, "Branch Banking and the Structure of Competition," Studies in Banking Competition and the Banking Structure, The Administrator of National Banks, U.S. Treasury, Washington, D.C., 1966.

⁵The studies of George Benston, "Economies of Scale and Marginal Costs in Banking," Studies in Banking Competition and the Banking Structure, The Administrator of National Banks, U.S. Treasury, Washington, D. C., 1969; Frederick W. Bell and Neil B. Murphy, Economies of Scale in Commercial Banking, Federal Reserve Bank of Boston, 1967, are examples of this approach.

measures, but that the magnitudes of the economies vary among the functions. They also found that bank "specialization" in business loans led to economies of scale apart from the economies that arise from transaction size. While the analysis of bank functions has not been applied specifically to agricultural credit extension it would be reasonable to expect that some economies of scale would exist for that function in much the same manner as for business loans. The extent of such economies, however, is unknown.

In spite of differing approaches and criticisms of techniques, these studies present a fairly clear cost pattern, at least for the small banks, in terms of deposit size. There seems to be little doubt but that economies of scale do exist for a considerable range of deposit size categories and that when deposits are used as a proxy for output the average cost curve traces a slope that is declining quite sharply in its early stages and then declines much less sharply through an intermediate range.

Specific turning points, however, are much more difficult to determine. Alhadeff and others seem to accept the \$5 million deposit level, the point at which further increases in size bring much smaller declines in cost. In one summarization of the literature, it is argued that banks of less than \$10 million in asset size are probably "grossly inefficient" and goes on to say that it seems likely that significant economies of scale prevail beyond the \$10 million asset size but that they are probably of a smaller order of magnitude.^{6/} Supporting the findings of economies of scale in a study by Hester and Zoellner which found that banks with less than \$10 million in deposits had markedly lower ratios of profits before taxes

⁶S. I. Greenbaum, "Competition and Efficiency in the Banking System -- Empirical Research and Its Policy Implications," Journal of Political Economy, August 1967.

to total assets than other banks which would imply higher than average cost for these banks.^{7/}

Using the evidence presented in these studies we can formulate a criteria about the meaning of the term "small bank." In terms of economies of scale it seems reasonably clear that as banks increase in size to \$5 million in assets average costs decline, perhaps sharply. Further economies are probably significant as their size increases to the \$10 million level. From that point generalization becomes more risky. For the range of banks that will be involved in extending credit to farmers, however, it is probably best to assume near constant returns-to-scale after the \$10 million level.

Given these results and the size distribution of existing banks, the banking industry would seem to contain a large proportion of relatively inefficient units. This is especially true of the Ninth District where, in 1968, 65 percent of banks were less than \$5 million in deposit size, 20 percent had deposits of \$5 to \$10 million, and only 15 percent were in the \$10 million and over category.

The continuing predominance of small size banks in an industry characterized by increasing technical efficiency for larger units is frequently explained in terms of prevailing public policy. This policy, in general, attempts to stabilize the banking industry and preserve competition through restrictions on entry of larger banks into given markets primarily by prohibitions against branching. If freer entry were permitted larger size banks would presumably drive out the smaller, less efficient bank, thereby

⁷Donald D. Hester and John F. Zoellner, "The Relations Between Bank Portfolios and Earnings: An Econometric Analysis," Review of Economics and Statistics, XLVIII, November 1966.

reducing the total number of competing banks throughout the commercial banking system. The implication of this reasoning is that the small banks, as well as the large have, by virtue of public policy, been granted a 'quasi-monopoly' position in their respective markets. The survival of the small bank is also augmented to some extent by lower wage rates and a favorable income tax position. The assumption of almost constant returns after the \$10 million deposit level, of course, means that banks above that size can compete with one another on rather equal footing.^{8/}

To some extent, the current interest in the extension of branch banking into rural areas where now prohibited arises out of the results of the research summarized here. Given existence of economies of scale it seems inevitable that some savings in costs and improvement in banking performance would occur through the consolidation of banking facilities and the elimination of some relatively small banks. The weight of the evidence, moreover, suggests that banks of less than the \$5 million deposit range operate at significantly higher unit costs and that the bulk of savings from consolidation would occur at this level.

The problem, though, is how does this cost disadvantage affect the extension of credit to farmers? Other things equal, does it seem reasonable to expect some differences in the terms of such credit among banks due to the cost differences? Or, to put it somewhat differently, is it reasonable to expect the cost and terms of a specific farm loan to be different at a large bank from what they would be at a small bank? Unfortunately the answers to these questions cannot be found in cost analysis alone. Potential gains

⁸For further evidence of this see The Future of Small Banks - An Analysis of Their Ability to Compete with Large Banks, by Ernest Kohn, New York State, Bank Department, December 1966.

in efficiency may or may not be passed on to the customer depending to a large extent on the competitive nature of the market.

Bank Ownership and Performance.

Form of ownership has an influence on performance that is unique to the banking industry. Three general forms of ownership are the (a) unit (independently owned) bank, (b) banks affiliated with registered bank holding companies and (c) branch bank systems. In general there is a relationship between deposit size and form of organization with unit banks dominant in the relatively small bank category and branch bank systems dominant among the larger. Holding-company affiliates range from small to relatively large banks and there is some overlap among all organizational forms and size categories. The focus here, however, will be on the relationship between ownership and performance.

Small unit banks located in isolated rural areas are perhaps the most adversely affected in performance terms by the form of ownership. Their potential to expand in size is limited because deposit growth depends primarily on the economic growth in their market area. Bank capital growth is generated for the most part through bank earnings and their access to outside equity capital is restricted. Direct lending opportunities of these banks are also limited by relatively small market areas. The small market size tends to restrict the range of bank services that can be extended to clientele and precludes the cost advantages that are associated with higher levels of output.^{9/}

The small unit bank can partly offset disadvantages of size and limited market by using the correspondent banking system. Correspondent banking involves a relationship between banks, typically banks of different

⁹We shall explore implications of market size to performance in greater detail in the next section.

size, in which the larger bank provides a variety of services to the smaller bank and in payment for these services the smaller bank maintains a demand deposit balance with the larger correspondent bank. The credit services provided under this system provide a mechanism of transferring funds back to the rural bank to compensate for the small bank's lack of resources. The most common transfer method is through loan participations typically on loan requests that exceed the legal lending limits of the small bank -- the overline loan. Small banks may also request participations in selected loans in order to spread risk or, when a bank is loaned to capacity, to acquire funds to meet additional loan requests.

In theory, a well organized correspondent banking system should allow the small bank access to many of the economic advantages associated with size. In practice, however, the system appears to fall considerably short of expectations.^{10/} Among the reasons usually given for this is an apparent reluctance on the part of the smaller bank to seek participations for fear of losing the customer and the existence of frictions on the flow of funds due to the difficulty of exchanging loan information between banks. The smaller bank is also in a relatively weak bargaining position when determining the credit terms associated with a participation loan. The diverse interests of the large and small banks further tend to weaken the relationship and create uncertainty as to the continuity of the correspondent bank as a source of credit. The use of demand deposit balances as a means of payment for services also tends to obscure the costs involved in correspondent

¹⁰ For an extended analysis of this problem see "Correspondent Banking," Monthly Review, Federal Reserve Bank of Kansas City, March-April, 1965, and "More on Correspondent Banking," Monthly Review, Federal Reserve Bank of Kansas City, July-August, 1965, as well as "Banking Structure and Performance," by Jack M. Guttentag and E. S. Herman, Bulletin, Nos. 41-43, Institute of Finance, New York University, February 1967.

transactions resulting in difficulties in evaluating the service. Moreover, a major criticism of the correspondent banking system is that correspondent balances act as a drain on the resources of the rural bank that could otherwise be used for credit in the local market. As a result of these frictions, some observers believe the correspondent banking system has been of only limited usefulness as a source of nondeposit resources for the rural bank.

Perhaps the most significant operating characteristic of the small unit bank is the tendency for these banks to hold more of their resources in assets other than loans compared with bank holding-company affiliates and branch bank systems. The reasons for this difference are difficult to pinpoint. To some extent, lower loan levels relative to total deposits may reflect a higher degree of risk in specific market areas. The problems associated with the correspondent banking system could add to this by making risk avoidance more difficult for the small bank and by creating a condition where correspondent balances are in excess of the amount necessary for the payment of services. Low loan levels at smaller unit banks might also suggest that there is insufficient credit demand in their markets although there is some evidence that generally more conservative lending policies prevail in small unit banks.

Bank holding companies offer a means of overcoming many of the disadvantages facing the small independent bank. A major advantage is elimination of many of the inadequacies that exist in the correspondent banking system. Holding companies can give affiliate banks direct access to a broad range of banking services, better management services, and provide an opportunity to use more efficient operating techniques. To some extent, holding-company affiliates can also offer a wider range of services to bank customers in rural areas. Advantages are similar to those that can be attained through the vertical integration of several units.

The greatest economic advantage over the independent bank would appear to be the holding-company affiliate's ability to better acquire and allocate resources, spread risk and seek capital backing from its parent company. Credit mobility among affiliate banks, although restricted by the law, is achieved through loan participations and the possibility of direct loans by one affiliate to the customers of another. Although affiliate banks may not sell loan paper to another bank in the same system the holding company may do so, thus providing additional funds for "loaned up" banks. As important as the ability to transfer funds, is the potential ability to transfer risk among the affiliate banks. The greater capital backing inherent in a holding-company organization allows the affiliate bank to accept more risk and, thus, increase its loans as a proportion of assets.

The performance of a bank holding-company affiliate appears to be affected to some degree by the organizational form. In a study of a selected group of such banks Robert Lawrence found that affiliate banks have significantly higher loan-to-asset ratios and that a greater proportion of assets are allocated to state and local government securities than comparable independent banks.^{11/} This tends to support the argument that the independent bank, because of its isolated location and conservative management tends to shift funds out of its market area to a greater extent than holding-company affiliate banks. While this conclusion is contested by Jessup,^{12/} whose

¹¹The Performance of Bank Holding Companies, by Robert J. Lawrence, Board of Governors of the Federal Reserve System, December 1966.

¹²"Changes in Bank Ownership: The Impact on Operating Performance," by Paul Jessup, Staff Economic Studies, Federal Reserve Board, Washington, D.C., April 5, 1969.

study indicated asset distribution was more a reflection of management factors than form of ownership, the possibility of such a shift of funds from direct lending in the market area, combined with the maintenance of balances in correspondent banks by independent banks, indicates that the holding-company organization could increase the amount of funds available to a given bank market.

The allocation of funds by affiliate banks as compared to unit banks may result in a small change in the flow of funds to agriculture. The Lawrence study, for example, found that affiliate banks allocate a significantly higher proportion of assets to consumer installment loans than comparable independent banks as well as a slightly larger allocation to business and mortgage loans. The proportion of farm loans at affiliate banks was lower than that at independent banks although the difference was not statistically significant. Other than higher loan-to-deposit ratios and shift in asset distribution, differences in bank performance with respect to their effect on customers between affiliate and independent banks were not significant. Lawrence found no significant differences in interest charges on loans or interest paid on time deposits among the banks studied while affiliate banks had higher charges on demand deposits.

Because of the limited evidence available concerning the farm credit services of banks, it is difficult to reach conclusions concerning the impact of ownership differences on the cost and terms of credit extended to a farmer. A possible difference in the amount of credit extended to an individual customer might exist due to the superior capital position and the ability to absorb more risk by the affiliate bank. Affiliate banks, assuming superior management and supporting administrative assistance of the holding company, might also extend credit on a more sound basis than an independent bank in terms of the borrowers' credit capacity. However,

these are presumptions that need to be tested.

The primary advantage of the holding company form of organization appears to be its ability to utilize more of its capacity and in making more of its resources available to the local market. There is no apparent reason to believe that these funds either would or would not be made available to agriculture, however. Finally, the greater ability of the affiliate bank to participate in overline and other loans probably leads to a larger proportion of economically above-average farms in the farm-loan portfolio compared with that of an independent bank.

One problem in evaluating studies comparing affiliate and independent banks is that while banks of comparable structural characteristics are usually included, the small number of affiliate banks in the small size categories makes it difficult to determine performance differences in the small rural bank category. It seems likely that markets served by smaller banks would offer fewer opportunities to expand installment and business loans to affiliate banks and the allocation of assets may be different among affiliates of different size due to market differences. If a limited market restricted the opportunities of the affiliate to move into more profitable lending categories, the affiliate like the independent might transfer more funds to other bank markets.

The branch bank system form of organization combines the economies of scale and vertical integration. In general, a branch bank system is an independent bank that operates through a series of offices dispersed through different market areas. In this manner a bank can pool the deposits acquired in the individual offices and affect the transfer of funds from surplus to deficient areas through the bank accounting system. The effectiveness of a branch bank system depends, of course, upon the size of the bank and the extent to which it can operate offices in diverse market environments.

Limited branching, as found in most state laws, precludes branch banking from achieving the full effect of the organizational form. For the most part, however, branch banks tend to be much larger than independent unit banks. In spite of the legal limitations on branching, a bank with geographically dispersed offices avoids many of the disadvantages of the independent unit bank. Such banks are not tied to the deposit and loan limitations of a single market.

Studies of branch bank performance show much the same pattern as that found in the analysis of holding-company affiliates as compared to independent unit banks.^{13/} Branch bank systems typically have higher loan-to-asset ratios and tend to be more aggressive in extending consumer and business loans. They are also likely to operate in more markets than either of the other forms given their ability to open offices in different areas. The influence of economies of scale however is open to debate. While the bank with branches exhibits economies due to size, they tend to have higher costs than unit banks of the same size and little is known about the differences in the average costs of operating a branch office as compared to a unit bank of the same size.^{14/}

Branch banks can make the total resources of the branch bank system available to local customers without the frictions of the correspondent or holding-company arrangement, although there is little information on the allocation of bank credit among branches. Extensive shifting of funds among

¹³For example see Horvitz and Shull, op. cit.

¹⁴This question is explored by Horvitz in "Economies of Scale in Banking," Private Financial Institutions, Commission on Money and Credit, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1963 and by Hester, op. cit. There appears to be no strong conclusion possible although branch offices may have some cost advantage in the lesser bank size range.

offices with some offices extending credit well in excess of its deposits, is possible in a branch system, a performance all but impossible for the unit or affiliate bank. To achieve this allocation, however, other offices in the system must have deposits above their loan levels. A primary attribute of a branch bank system, nevertheless, is this capability for a unrestricted movement of funds throughout the office network.

The distribution of assets in a branch bank system probably reflects the investment opportunities that exist in all offices. Rates of return on various investments and differences in growth rates in different market areas can be expected to influence the investment decision process within a branch system as would be true in any bank. The existence of branch banks, assuming larger market area and deposit size, probably results in a greater utilization of resources in direct loans to customers in the market area than when branch banking is prohibited. Differences in management capabilities could lead to different portfolio holdings as could a different management attitude about the necessity to extend credit to local customers. All banks undoubtedly respond to local credit needs, at least to the extent necessary to attract deposits.

While the economic tie to a local market is more important to the unit bank than to a branch office, the overall effect of market area on credit extensions in rural areas is conjectural. What little information that exists about agricultural lending tends to be inconclusive. The large western U.S. branch bank systems appear to be significant factors in the farm credit market while past Canadian experience suggests that branch banking is less important in the farm credit market. In general, in evaluating branch bank performance it seems reasonable to assume that, in terms of the cost and other terms of credit extended to the farmer borrower, the branch performance would be similar to that of a holding-company affiliate. The

total quantity of credit to agriculture however may be adversely affected by branch banking depending on the alternative investment opportunities open to the branch system.

Bank Competition, Markets and Performance.

Attempts to apply the traditional economic criteria of competitiveness in banking have met with only limited success. There is a general tendency, however, to find symptoms of monopoly strongest among the smaller banks. A presumption that monopoly power exists in small banks can be drawn from the theory of market structure. That theory holds that a competitive environment requires a large number of buyers and sellers with none dominant, products that are close substitutes, and relatively free entry into the industry. The absence of these characteristics leads to less than competitive markets. Certainly the review of bank market structure shows many departures from the competitive norm. However, if we are concerned with a specific bank product, such as farm credit, the market must be defined in terms of the buyers and sellers of that product and not the entire range of bank outputs. We shall follow this approach in discussing the "market" and its effect on performance.

The market for many of the functions performed by banks, particularly rural banks, is largely a function of location and convenience. Several studies have found that customers tend to select banks on the basis of accessibility with respect to their home, place of business or place of employment.^{15/} These conditions would hold especially in rural areas where

¹⁵For example see, "Bank Markets and Services: Three Surveys," by George G. Kaufman, Commercial Banking: Structure, Competition and Performance, Federal Reserve Bank of Chicago, August 1967; and A Study of Selected Banking Services by Bank Size, Structure and Location, by Robert Weintraub and Paul Jessup for the Committee on Banking and Currency, House of Representatives, 88th Congress, Second Session, November 17, 1964.

distance and alternative banking facilities become more important than in urban places. In a study of selected banking services Weintraub and Jessup observed that "...unit banks, smaller banks and banks in rural areas and smaller cities tend to serve 'neighborhoods',"^{16/} and that amount of services extended increase with the size and, presumably in turn, market area of the bank. In conclusion it also noted that "...banking services generally are supplied where a demand exists." This implies that performance is, to some extent, a function of demand as is predicted by price theory.

Weintraub and Jessup also found that a bank's commercial and industrial loan market is highly localized. Banks, regardless of size tended to make 70 percent or more of all business loans to firms located in the bank's home city although smaller banks (less than \$10 million in deposits) tended to make a relatively larger proportion of such loans to firms within a 40 mile radius of the bank. The larger banks held a greater proportion of business loans to firms located more than 50 miles from the bank office. This pattern is not too surprising inasmuch as the larger banks have greater access to national markets as compared with smaller banks. The activity of the smaller banks in the 50 mile range probably reflects trade area considerations, particularly in the agricultural sector, and the lack of banking alternatives for businessmen in some rural areas.

The localized nature of a bank's market is important to the analysis of bank performance with respect to farm credit. The literature indicates that the greatest overall departure from competition is among the smaller banks in more or less isolated market areas, more specifically in rural communities. It is in these cases where only one or at most a very

¹⁶Weintraub and Jessup, op. cit.

few alternative banks are available and the number of substitutes for bank services are likely to be limited. The entry of new banking firms into these markets is likely to be severely restricted because of the size of the market and the bias of the bank regulators toward limiting the number of banks in order to improve and insure the safety and viability of the existing bank.

The effect of the number and size distribution of banks in a given market on bank performance, however, is still a matter of controversy. Edwards, in his study of bank performance in metropolitan areas found a significant relationship between concentration and performance with greater concentration of banking resources associated with high loan rates.^{17/} Other studies tend to support this finding although much of the evidence suggests that concentration, per se, is of little influence and that other structural elements are more important to bank performance.

The potential for bank monopoly power in a rural isolated community, however, would appear to be limited. Certainly some bank functions are likely to be more monopolistic than others. The lack of convenient alternatives for depositors' services is perhaps the most significant of these. On the bank credit side, the small business loans and, perhaps, mortgage and consumer loans are probably the most likely to have few available alternatives and more affected by monopolistic tendencies. The potential for monopoly power with respect to farm loans would appear much more limited in view of the alternative sources of credit available to farmers especially from merchants and dealers and the cooperative credit system. Given these alternatives it is difficult to argue that even isolated banks hold monopoly

¹⁷ Franklin R. Edwards, "The Banking Competitions Controversy," Studies in Banking Competition and Banking Structure, Comptroller of the Currency, Washington, D. C., 1966.

positions in the farm credit market. Thus, it seems reasonable to assume that the performance of banks with respect to the cost and terms of farm loans will be highly influenced by competing institutions.

The problems associated with bank cost analysis become more complex when market considerations are introduced. Assuming deposit size and market size are positively related we would expect the larger banks not only to have greater opportunity in reducing transaction costs through larger transactions but also to be able to diversify their portfolios significantly more than smaller banks with their restricted markets. This would tend to give the larger bank a different product mix than the smaller bank which would obscure the basis for comparing banks of different sizes. One explanation for the apparent existence of economies of scale among banks is the difference in product mix; thus lower average cost would not necessarily be due to differences in efficiency, per se. This view suggests that some differences in performance are due to market conditions.

The effect of a localized market on bank performance may well be of greater significance than the effect of economies of scale or bank concentration. As Carson and Cootner point out, "There is little doubt that on a priori grounds alone, small banks face greater risks than large ones. Given the localization of both loans and deposits, a greater proportion of each is more likely to depend on the economic health of a single town or limited group of firms.^{18/} The risk problem would appear to be accentuated for small banks in predominantly agricultural areas. A concentration of loans in a limited rural market exposes the bank to the vagaries in local

¹⁸"The Structure of Competition in Commercial Banking in the United States," by Deane Carson and Paul H. Cootner, Research Study 2, Private Financial Institutions, Commission on Money and Credit, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1963.

weather conditions and, to the extent that agricultural production is specialized in the market area, to the particular economic conditions facing the bank's customers. Larger size banks could disperse this risk over a broader geographic area and, perhaps, a more diversified group of customers.

A further market area factor is the likelihood that many small banks located in communities with small population and mainly small businesses, which exist to serve agriculture, are highly dependent upon the farm economy. Banks so located are not only faced with risk conditions inherent in agriculture but lack the opportunity to diversify their loan portfolios through direct loans to nonagricultural business firms and consumers. Carson and Cootner found evidence of this risk factor in a comparison of loan losses among banks.^{19/} Actual losses for the smallest banks amounted to 0.22 percent of loans while losses for the largest banks amounted to only 0.05 percent. While the difference between the groups is large, such losses account for only a small percentage of total loans. In their analysis Carson and Cootner found that smaller banks charge higher rates on loans although they could not separate the premium due to risk from the premium associated with the higher cost of handling small loans. Along with the possibility of charging a risk premium, a bank may also avoid risk through customer selection, restrictions on the amount of individual and total loans, and the terms of the loan.

While a larger bank, given a larger market area, faces a smaller risk exposure, the fact of a broader market also has implications for total agricultural credit. If it is assumed that larger banks are located in communities with more diversified local economies, then these banks have a greater opportunity for a broad loan mix in their portfolios. This would

¹⁹ Ibid.

allow a reduction in market area risk due to concentration of a specific type of loan and should, presumably, result in lower loan charges and more appropriate credit terms, other things equal. Such banks, however, having many alternative outlets for their loans and holding the resources necessary for large transactions can also be highly selective in accepting farm customers. Further, given the specialized nature of farm loans, larger banks can concentrate their lending efforts in other areas such as commercial and consumer credit. If this is the result of large size, then it is possible that total credit to agriculture is diminished as banks grow in size.

The deposit resources of a bank, which are tied to the economic conditions in its market area, obviously limit the amount of credit that can be extended to an individual borrower. Loan size is restricted, in one sense, by the amount of risk a bank can afford to carry. This is recognized in the legal limitations that are imposed on banks with respect to outstandings held by the individual borrowers. Because of the growth in credit demanded by many farm firms this limitation is of considerable importance to the small rural bank. In a study of bank credit to farmers it was found that one bank in seven had farm loan requests that exceeded their legal limits and that over 25 percent of these banks held less than \$300,000 in capital and surplus^{20/} and that few banks of over \$500,000 in capital and surplus indicated such requests. The study also found that even though the number of overline requests was relatively small, the dollar amounts associated with those loans were significantly large. This suggests that smaller banks were having difficulty servicing their customers.

^{20/}"Bank Financing of Agriculture," by Emanuel Melichar, Federal Reserve Bulletin, June 1967.

Banks can avoid this limitation by sharing the loan with another bank through a participation agreement. In general, such arrangements are not common relative to the total amount of agricultural credit extended by banks. Various reasons exist for this, such as the difficulty of exchanging the necessary loan information between banks and possible reluctance on the part of the banker or borrower in working with split credit transactions. The pressure on a bank's total resources, however, may act to further reduce the scope of the bank's market by eliminating the larger and presumably more profitable farm firms. This would lead to an increase in the risk exposure of the bank due to a concentration of small farm loans in the portfolio and reduce the bank's ability to lower costs through larger transactions.

Conclusion

In this paper we have explored the relationship between market structure and performance with respect to a specific bank function -- the extension of agricultural credit. In general, the literature indicates that those variables usually associated with bank market structure have an influence on bank performance although, in the case of a specific bank product such as agricultural credit, the interrelationships among the variables produces a complex performance pattern that is difficult to interpret. For example, conclusions about performance drawn from the results of research into bank economies of scale need to be qualified when other structural variables such as the degree of competition and the relationship between size of market and risk exposure are included in the analysis. Thus, specific conclusions about the relationship between structure and performance in the extension of agricultural credit are not sharply defined and tend to be conjectural. This reflects both the inadequacies of traditional market structure theory when applied to a multi-product firm, and a lack of

empirical research, particularly in those aspects of market structure relating to the market environment.

While theory leads to inconclusive answers to the central problem posed in this paper it does lead to the delineation of the appropriate questions for empirical analysis. For example, it is apparent that more research into the relationship between banks size and such variables as risk exposure, investment alternatives and portfolio decision making must be undertaken in order to understand their joint influence on performance.

Even in the area of bank economies of scale, where a considerable amount of empirical research has been accomplished, it is clear that further work is needed. Greater efforts are needed due to both the conceptual difficulty in translating traditional market theory to the multi-product firm situation and to the difficulty in defining bank output. For the most part, broad generalizations about bank performance derived from cost and scale studies oversimplifies the complex nature of bank operations. While such studies indicate a decline in average cost as banks increase in deposit size it is a questionable procedure to compare banks of different size given differences in other variables, such as markets, among these banks.

Finally it should be recognized that this paper focused on bank performance as influenced by a few structural variables. While these variables may well influence the agricultural credit function of a bank, the influence may be insignificant when compared to the influence on performance of other factors such as the nature of the loan and the characteristics of the specific borrower. These factors may dictate costs and terms of the loan while structure characteristics would be of little consequence. This would imply that, from the view of the individual farmer borrower, the banking system could be homogeneous as a choice of credit and that changes in banking structure would have little or no effect on the bank's performance from the borrower's point of view.