measure, explained between 27 percent and 42 percent of the variability in deposit rates for MMDAs, SNOWs, and CDs (table 2). Individual variables generally behaved as anticipated.

Deposit composition helped to explain rate differences for all the deposit accounts examined. Institutions holding lower percentages of deposits in demand and NOW accounts paid higher deposit rates. Such institutions presumably had greater demand for MMDAs, SNOWs, and CDs. In addition, operations occurring in faster growing markets paid higher rates on personal MMDAs and SNOWs. Apparently, population growth caused the supply of deposits to increase by less than the demand for deposits.

Deposit rates for personal MMDAs and CDs were lower at institutions with more offices per dollar of deposits in the market. More offices per dollar of deposits reflect greater convenience for depositors.

Institutions extending more loans and generating higher revenues had greater demand for deposits since they could earn more on these funds than other institutions. Loan growth helped to explain higher rates on personal MMDAs, SNOWs, and CDs, and higher average revenues contributed to higher rates on business MMDAs.

Finally, depositors earned higher rates in less concentrated markets. Whether measured by the HHI, or by the four-institution concentration ratio, market structure was important in explaining rate differentials among the institutions for SNOWs and CDs. In fact, market concentration substantially improved the overall ability of the model to explain rate differences for MMDAs and SNOWs. When the HHI was added to the relationship, the explanatory power (adjusted R²) increased from 0.28 to 0.36 for personal MMDAs, from 0.35 to 0.41 for business MMDAs, and from 0.23 to 0.27 for SNOWs.

Conclusion

Findings suggest that local market concentration affects rates paid on SNOWs and MMDAs. Higher rates were paid by depository institutions operating in more competitive areas as reflected by market structure measures. Although rate deregulation has certainly caused deposit rates to be more sensitive to money market conditions, the local competitive environment remains important.

Rates paid on CDs, however, were not statistically associated with local market structure measures. One interpretation of this finding is that the markets for CDs might have been in disequilibrium when the survey was conducted (one month after rate ceilings and minimum balance requirements were removed). Another interpretation is that counties and metropolitan statistical areas are not good for defining consumer CD markets in Ohio.11

Commercial banks and thrift institutions have always competed aggressively for deposits, but in today's market they must increasingly rely on rate competition to attract depositors. They have to do this because recent changes in regulations have transformed the deposit market.

Authorization of money market accounts (MMDAs) and Super-NOW accounts (SNOWs), and the removal of rate ceilings and minimum balance requirements on certificates of deposit (CDs), have changed the ground rules for depository institutions.10

Rate deregulation, technological improvements in telecommunications, and increased consumer sophistication have reduced the isolation of local markets and increased rate competition. Consumers appear more price-sensitive and less convenience-conscious in choosing a depository institution. It could be argued that the geographic market for deposits has become nationwide, even though interstate branching is not possible.

Many consumers now hold savings in money-market funds that cater to a nationwide market. Some large depository institutions advertise deposit rates throughout the United States. In spite of these changes, however, noticeable deposit rate differences still exist among institutions operating in different geographic areas.

Identifying Markets

Depository institutions provide different products to many customers, and the geographic market area can vary from product to product, and from customer to customer.

The market area for large corporate loans and deposits, for instance, is national and often international in scope. Buying and selling large negotiable CDs (over $100,000) is usually conducted electronically. Location generally does not alter the transaction costs, which usually represent an insignificant portion of the yield. In contrast, purchasers of small CDs and other consumer deposits incur transportation costs such as distance and time, which are directly related to location and can be significant. Because of these transaction costs, the alternatives of consumers are generally limited to institutions that operate in an area in which they live, work, or shop. It is generally too time-consuming and expensive for most consumers to consider depository institutions outside of their immediate area.

Regulatory agencies such as the Federal Reserve System are required to prevent bank mergers and acquisitions that would have substantially adverse effects on banking competition. After specifying the product market, regulators must delineate the relevant geographic banking market. This area should include all institutions whose output decisions react to the same set of supply and demand factors. The Federal Reserve System defines a geographic banking market as an area in which buyers and sellers of banking services can interact without significant transaction costs. Such an area generally contains one community that is the center of economic activity and surrounding communities that are economically integrated with the hub city to a large degree.

This determination is made through the analysis of many factors, including the absolute and relative size of the communities, population density, transportation networks, commuting patterns for employment and shopping.12
Higher minimum balance requirements and monthly maintenance and per item fees for deposit accounts tend to be higher for larger deposit sizes, thus requiring higher rates to attract customers.

Institutions also incur implicit costs of opening and maintaining accounts that are difficult to measure. A rough measure of inconvenience and transportation costs is the number of offices that an institution operates in the market relative to its market deposits. More offices per dollar of deposits should reflect more convenience and lower transaction costs for depositors. Assuming a tradeoff between deposit rates and convenience, depositors would supply an equal amount of funds at different rates, provided the lower rate were offset by more convenience or lower transaction costs.

Institutions operating in faster growing markets might pay lower rates because they enjoy a growing pool of potential new customers.

Institutions with greater demand for deposits may pay higher rates. Demand for deposits is derived from the demand for the institution's loans, which determine the value of the deposit input to the organization. To maximize profit, an institution should acquire deposits (and other liabilities) until the additional cost per dollar is equal to the additional revenue gained from its use. To capture demand for deposits, several factors were considered:

- The institution's return on average assets and loan growth in 1983 are used to estimate its investment and loan opportunities. Higher revenues and faster loan growth would enhance the institution's demand for deposits.
- The administrative and operating costs of acquiring funds and making loans and investments should affect the value of deposits. More efficient markets and lenders have an incentive to pay higher rates to attract more deposits. Asset size is employed in measuring institutional size and differences due to operating efficiencies.
- Deposit demand may vary by type of account. A "preference" or "niche" for certain deposits would motivate an institution to pay a higher rate. For example, institutions holding a smaller percentage of demand and NOW deposits would have stronger demand for other types of deposits.

In addition to the preceding factors, prices should be influenced by market structure—by the number and relative size of competitors in the market. Additional local market definitions are still relevant after deposit rate deregulation, it should be possible to detect deposit rate differences among offices serving the same market areas. Theory implies that institutions would have to pay higher deposit rates in more competitive markets. There is no unambiguous measure for market structure, but researchers typically employ either a Herfindahl-Hirschman Index (HHI) or the concentration ratio, or the Hirschman-Herfindahl Index (HHI).

A concentration ratio describes the portion of the market held by the largest institutions. Such a ratio is simple to calculate, and has been accepted by the courts as a measure of competition. The HHI, which takes into account both the number and the size distribution of all competitors in the market, is a more comprehensive measure of market structure. It is computed by adding the squared relative size of competitors in the market. In contrast, SNOWs have higher revenues and thrift institutions offer these accounts primarily to a common group of customers. The geographic areas where they generally market these accounts, and where consumers and small firms can conveniently find alternative depositories, are assumed to be represented by metropolitan statistical areas and counties outside of urban areas. These areas provide the traditional definitions of local markets employed in banking structure research.

The sample of depositary institutions referred to in this Economic Commentary includes 37 commercial banks and 34 thrift institutions. These institutions had deposits ranging from $4.3 billion to $16.6 million and are headquartered in 28 local market areas. Deposits are divided for banks and thrifts as measured by the HHI, varied from 425 to 3,469 in local markets.

Deposit rates and balance requirements varied by type of account and among institutions (table 2). Rates showed more variability with size equality among market participants.

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