FDIC Outlook

SPRING 2005

In Focus This Quarter: Interest Rate Risk and Funds Management

Starting in mid-year 2004, the Federal Reserve began raising the target federal funds rate from historical lows. As a result, the shape of the yield curve flattened substantially during the second half of 2004. These changes in the interest rate environment have prompted some industry observers to express concerns about interest rate risk at FDIC-insured institutions. This issue of ***FDIC Outlook*** assesses the extent of interest rate risk and emerging issues in liquidity and funds management of FDIC-insured institutions.

FDIC Chief Economist Richard A. Brown (far right) leads the discussion at the Interest Rate Risk Roundtable. Panelists are (l to r): William A. Stark, FDIC; Tanya S. Azarchs, Standard & Poor's; and Hal S. Johnson, BB&T.

Perspectives on Interest Rate Risk Management in the U.S. Banking Industry

The FDIC hosted a roundtable discussion with industry experts on January 13, 2005, to identify major issues in interest rate risk management for FDIC-insured financial institutions. FDIC Chief Economist Richard A. Brown moderated the roundtable, which consisted of Tanya S. Azarchs, Managing Director of Financial Services Ratings at Standard & Poor's; Hal S. Johnson, Executive Vice President of Funds Management at BB&T; and William A. Stark, Associate Director of Capital Markets in the FDIC Division of Supervision and Consumer Protection. *See page 3.*

Profiles of Depositories Exposed to Interest Rate Risk

Recent increases in short-term interest rates have some market participants concerned about how bank and thrift earnings would respond to an increase in longer-term assets at many institutions. A related concern is the indirect effect of interest rate increases on borrowers' credit quality. This article describes some general profiles of depositories that may be vulnerable to rising interest rates and why rising interest rates appear to pose less of a concern today than during the 1970s and early 1980s. *See page 14.*

Rate/Volume Analysis: An Off-Site Approach to Measuring Interest Rate Risk

A rising interest rate environment can have varying effects on an institution's earnings, depending on its asset/liability structure. Assessing the amount of interest rate risk prevalent using off-site data is challenging. An alternative method of assessing interest rate risk for a particular period is through rate/volume analysis. The article uses this technique to assess how rate-sensitive earnings were at community banks during the past 12-month period. *See page 21.*

Funding Asset Growth in a Rising Rate Environment: National and Regional Perspectives

During the past decade, greater competition for traditional deposits among industry participants, credit unions, and other financial intermediaries has led to funding challenges for many FDIC-insured institutions. This article analyzes liquidity and funding issues from both a national and regional perspective. *See page 25.*

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Roundtable panelists are (l to r): William A. Stark, FDIC; Hal S. Johnson, BB&T; and Tanya S. Azarchs, Standard & Poor's.

Perspectives on Interest Rate Risk Management in the U.S. Banking Industry

Changes in the level and shape of the interest rate yield curve pose challenges for interest rate risk management in the U.S. banking sector. Based on a number of recent studies and analysis, there is general agreement that interest rate risk at institutions insured by the Federal Deposit Insurance Corporation (FDIC) is, for the most part, well managed. However, in spite of this general conclusion, there are a variety of approaches that individual financial institutions can take to manage this risk. Ultimately, the appropriateness of the techniques used by each institution to manage its interest rate exposures can only be evaluated on a case-by-case basis. But given that all institutions are subject to the same market forces and have to make similar types of choices among analytical techniques and mitigation strategies, it is also useful to discuss interest rate risk from a macro perspective.

It was with this goal in mind that the FDIC convened a January 13, 2005, interest rate risk roundtable to discuss macro trends and techniques with leading industry experts. The panel of discussants included Tanya S. Azarchs, Managing Director, Financial Services Ratings, Standard & Poor's; Hal S. Johnson, Executive Vice President, Funds Management Department, BB&T; and William A. Stark, Associate Director of Capital Markets, Division of Supervision and Consumer Protection, FDIC. The roundtable was moderated by Richard A. Brown, the FDIC's Chief Economist.

The following is a summary of the roundtable discussion.

MR. BROWN: Good afternoon, and welcome to today's interest rate risk roundtable. Interest rates are a topic that economists know a lot about, but interest rate risk is another matter. This is a highly institutional area, involving a complex interaction between interest rate and yield curve trends and the unique financial positions held by each depository institution. A great deal of institutional and technical information is required to understand this issue, and so we are very fortunate to have with us today a panel of experts who are accustomed to assembling this information into useful analyses.

I would like to start out by asking each panelist to give a little of his or her own institutional perspective on interest rate risk, coming from a rating agency, a bank, and a regulatory perspective.

MS. AZARCHS: As a rating agency, I think our interests are rather well aligned with the interests of regulators in the sense that we care first and foremost about what regulators call safety and soundness, or what we call relative imperviousness to default. But the difference that we have as a rating agency is that we do not spend as long examining or analyzing each institution. We leverage off the examination work the regulators do.

That being said, we look into the issue of interest rate risk in the context of a broader initiative, which is to look at enterprise-wide risk management. We have a fairly intensive effort under way to do that. We look at market risk as it is expressed in trading risk. We think that is a larger risk than structural interest rate risk-taking for the institutions that are major trading houses, and even not-so-major trading houses. Credit risk continues to be of paramount importance to us. We still think that when banks fail, they typically fail the good, old-fashioned way, which is by making a mistake on credit risk. If I were to rank-order interest rate risk, I would put it third on our list, coming after market risk and credit risk.

When we look at interest rate risk, we are looking at very much the same things that the regulators look at. We look at corporate governance—that is, the policies, the procedures, and the communication that goes on amongst the various constituents at a bank. We also look at the methodology and the measurement of the risks. It is very difficult for us to communicate back to the outside world how we get comfortable with the interest rate risk-taking, because interest rate risk management is an art and not a science. We are fully cognizant of the assumption-driven, methodology-driven conclusions that one reaches from it.

Broadly speaking, we think that banks have done a fairly good job of managing interest rate risk over the years, during which the net interest margin, for example, has been fairly solid and uncorrelated to rate movements in the industry. But, we look into interest rate risk just to make sure the regulators do not miss anything.

"We still think that when banks fail, they typically fail the good, old-fashioned way, which is by making a mistake on credit risk. If I were to rank-order interest rate risk, I would put it third on our list, coming after market risk and credit risk."

Tanya Azarchs

MR. JOHNSON: I would concur with Tanya that interest rate risk probably would not be "Job One" at our institution. Credit risk holds that top spot. We look at a broader definition than interest rate risk; we call it market risk, and we do pay very close attention to it. We do not have a tremendous amount of interest rate exposure on our balance sheet. However, from a market perspective, we have a significant exposure to those things that we cannot necessarily control, and those are the things that we spend a lot of time with our team trying to figure out. We try to gauge what the next thing coming down the track is and what we can do to help either mitigate the effect or somehow offset it.

Right now, for instance, competitive loan pricing is a big factor in our marketplace as the rates on loans relative to the traditional indexes have fallen. We have seen that particularly in the mortgage market. Additionally, the supply of loans is not very robust right now, so that obviously is reflected in the pricing.

It is a real challenge trying to model interest rate risk. You model what you believe your balance sheet growth is going to look like, and as that growth changes or becomes different from what your expectations are, that also has an impact on your interest rate risk profile.

We are still a heavily margin-reliant institution, and so the interest rate risk management process is very important to us. Maintaining that margin and making sure that we use appropriate hedges to try to minimize our exposure to extreme interest rate events is important to us.

MR. STARK: It is always enjoyable to talk about interest rate risk, because it is a challenging area and hard to describe. When you make a loan and somebody does not pay you back, you know what your loss is. However, if interest rates move against your balance sheet position, it is not as straightforward a process to measure your loss.

Looking at interest rate risk from a supervisory viewpoint, I try to keep track of two things. First, I keep track of the type of assets banks are buying. Second, I watch management's behavior in periods of volatile interest rates in order to assess how they are managing their risks during these periods, to see if they have adequate controls, hedges, or mitigants in place and how those controls perform.

Regarding the type of assets that can present interest rate risk, exposure to mortgage-related assets is an obvious starting point. The mortgage loan is not a perfect instrument. From an investor's perspective, there is a "flaw" in the basic mortgage that is used here in the United States: it has an option in it.

When you invest in a mortgage, there are three things that can happen—and two of them are bad. One event is that rates go up and the value of the loan goes down. A second event is that rates go down and the customer pays off the loan. A third event is that rates stay exactly the same and you earn exactly what you thought you were going to earn.

"When you invest in a mortgage, there are three things that can happen—and two of them are bad."

William Stark

As a result, this is an interesting category of assets to watch, because we know it creates unique challenges for the bank managers who are trying to manage the interest rate risk associated with these option instruments.

Finally, in an overall sense, I reach the same general conclusions as my fellow panel members that interest rate risk ranks secondary in a ranking of risks; it does not share the same level of concern as credit risk. Historically, we have found that credit risk is the primary cause of bank insolvencies, with rate volatility and related impacts to earnings and capital being an additive, but not primary, cause of failure.

MR. BROWN: I wanted to start getting into some detail by talking about modeling interest rate risk. Treatment of interest rate risk has made a lot of advances since the interest rate squeeze of the late 1970s and early 1980s. Mortgage lenders and other institutions have had to prepare for—and model for—volatile interest rates. Reliance on models is reassuring to many, especially to economists, but clearly models have their shortcomings. They have their challenges in terms of the accuracy of the inputs, the validity and testing of assumptions, and policies involving independent review.

I would like to hear your perspective on the art of modeling, and how reassured we should be with the results.

MS. AZARCHS: Perhaps I am speaking more for myself than for S&P at large, but it raises all of my antennae when I hear that something is all model-driven, because models are always very sensitive to the assumptions that you put into them. We are very leery of models because of these critical assumptions that have to be made, and we see different banks make very different assumptions that drive the outcome of the sensitivity models they run.

We rarely see a bank, at least among the top 100 that we rate, that does not indicate in its disclosure a fairly modest amount of interest rate risk—2 percent, 3 percent impact or something like that. Yet banks make critical assumptions about the duration of indeterminate maturity liabilities, like demand deposits and savings accounts. The assumptions vary all over the board; for example, we see assumed durations of seven months or seven years. You can make all the arguments that you want that maybe different deposit bases have different behaviors, but they are really not that different, not different enough to warrant an assumption of seven months versus seven years.

"We are very leery of models because of these critical assumptions that have to be made."

Tanya Azarchs

Some other assumptions that go into modeling are the prepayment of mortgage-related assets and the duration attributed to accrued receivables. There is also the issue with the large, complex banks where they sometimes carve out the trading book from the whole interest rate risk model. Trading books typically are short-funded because they are supposed to be short-lived assets, at least on the books, but whether you put in a large trading book or you take it out makes a big difference in terms of the results that you get from the model.

So, what are the right assumptions to make when modeling interest rate risk? The real question might be,

Tanya Azarchs makes a point, with Richard Brown at right.

what are the conservative assumptions? What will give you an investment portfolio that will not leave you high and dry if interest rates really take a big move?

MR. JOHNSON: I would certainly echo that the whole process of asset-liability management is an art, not a science. I think you have to look at your models as a series of tools that help you to build a circle around what your real exposures are and what your opportunities are.

> ***"I think you have to look at your models as a series of tools that help you to build a circle around what your real exposures are and what your opportunities are."***
>
> ***Hal Johnson***

We run a number of different models in our institution, and we look at all of the model outputs in the aggregate to determine the common themes that are impacting our institution and the unique things that some of the models show.

Modeling itself is extremely complex. We have ten people in our organization dedicated to running risk management models, and that is only one set of many models that we run in our bank. We run monthly processes and quarterly processes as we try to determine our market risk. We try to define what is going on with the interest rate environment and with our competitive environment as it impacts items on our balance sheet.

Given that we are coming off the lowest long-term interest rates in a generation, I think you have to question whether historical prepayment models will be accurate in the current environment. You have to put some parameters around that and shock the models and determine some reasonable levels of variation around the expectation that the model has given you.

That is really where the art comes into the process. You have the science there in the form of a model. To turn that science into the art, you have to use common sense. You have to use your sense of what has happened in markets historically and what you think is different about the markets today. And you have to try not to get wedded to one particular model outcome.

MR. STARK: As regulators, we have asked the question, what type of model does a bank need to have? We arrived at the conclusion that the bank should have a model that accurately measures its interest rate risk in light of the risk profile of the particular institution. There is, accordingly, no one-size-fits-all interest rate risk model.

And I agree with Hal that the risk models are just tools, and that is all they will ever be. We sometimes get a little concerned with institutions that get so involved in the quantification process and the results that they begin to not question the outcomes. From a supervisory perspective, we focus more on the validity of the overall risk measurement system and validation process, including, specifically, the nature of the bank's stress testing and that it is looking at a range of scenarios.

> *"There is no one-size-fits-all interest rate risk model."*
>
> *William Stark*

One area that we are fairly sensitive to is mortgage prepayments. If 25 percent of an institution's balance sheet is mortgage-dependent, that means 25 percent of the balance sheet has to have prepayment assumptions assigned to it. These can be a range of assumptions, depending on the coupons and other factors. One of the things we have observed in the past is that institutions may not always keep their prepayment assumptions updated. Mortgage prepayments are directly dependent upon the current interest rate environment, and that interest rate environment changes over time.

MR. BROWN: Are there any good, off-site quantitative measures that you can use to readily assess, at least at a broad level, the interest rate exposure of an institution?

MR. STARK: There are, and I can tell you what we do at the FDIC. Nine years ago, our Capital Markets Group developed an off-site monitoring tool called Interest Rate Risk Standard Analysis (IRRSA). IRRSA uses data from bank and thrift Call Reports and targets seven different factors that our examiners look at as part of the examination preplanning process. If the IRRSA model sends out red flags, the examiners know they need to consider spending more time during the examination looking at interest rate risk in the institution. So we also have the ability to monitor banks off site back in my department using these tools, and we talk to the regions if we see things that are out of line.

MS. AZARCHS: One of the things that we look at is the mortgage asset, which we think is really difficult, if not impossible, to hedge 100 percent. We look at the concentration in mortgage-backed securities and mortgage servicing rights (MSR), as well as the amount of other comprehensive income that more sophisticated banks may have.

MR. JOHNSON: From an external perspective, I would look at the financial instrument disclosures about derivative use and the rate of change in that derivative portfolio from quarter to quarter. I think that tells you a lot about whether the bank is really hedging out longer-term risk or whether it is trying to create market opportunities.

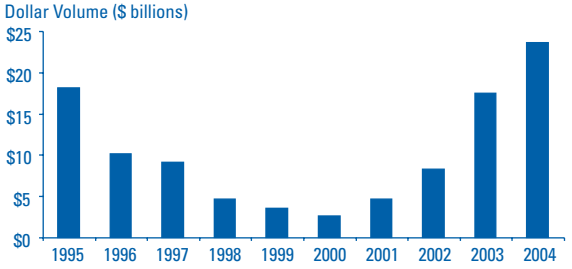
MR. BROWN: In the last interest rate cycle, during 1994 and 1995 when the Federal Reserve raised short-term interest rates by 300 basis points in just over 12 months, we heard a lot about problems with structured notes, or notes with embedded options. Some of the problems appeared to arise from the use of structured notes by relatively unsophisticated investors, but there may have been broader issues with the ability to manage the risks in general. Are structured notes of any concern in the present environment?

MS. AZARCHS: There are a lot more structured notes now. During the mid-1990s, many of the structured notes were, in fact, mortgage-backed securities of various kinds, either cash instruments or synthetic versions of the same. Currently, there are other types of structured notes.

Collateralized debt obligations (CDOs) are extremely popular, but it is difficult to get the disclosure on how many of them there are. CDOs may essentially represent an investment—and think of it maybe as a mutual fund—which is a fixed-income, interest rate risk-taking mutual fund that tries to better the returns in the bond market in general. All the bank has on its balance sheet is the equity portion, so there is no earnings impact until the day of reckoning comes. A lot of the interest rate risk in the off-balance-sheet fund is not recognized, so there might be some of those kinds of concerns out there. [See Chart 1.]

Chart 1

The Volume of Structured Notes at Commercial Banks Has Surpassed the Highs of the Mid-1990s



Notes: All data as of year-end except 2004, which is as of September 30. Structured notes are the fair value of those debt securities whose cash flow characteristics (coupon rate, redemption amount, or stated maturity) depend upon one or more indices or that have embedded forwards or options. Structured notes include step-up bonds, index amortizing notes, dual index notes, de-leveraged bonds, range bonds, or inverse floaters.
Source: Federal Deposit Insurance Corporation Call Reports.

MR. JOHNSON: I think there are a couple of issues that are tied to this. Many instruments on a bank's balance sheet have imbedded optionality, and that makes the modeling and the assessment of those instruments more difficult.

> ***"I think actually the worst interest rate environment for banks is a sustained, very low interest rate environment."***
>
> *Tanya Azarchs*

I think the mark-to-market issue is very interesting because you often have situations where one side of the transaction gets marked to market and the other side does not. If you properly structure a transaction, you may not have any real interest rate risk, but you might have an enormous amount of risk in that transaction from an accounting interest-rate-reporting standpoint. So I think you have to separate the economics from the accounting.

We do not currently use CDO products in our bank, but we do use other structured products like collateralized mortgage obligation products and mortgage-backed products, and the models for these products are fairly robust. Coming out of this low interest rate environment, is there some incremental risk there? Possibly so, but the state of the art in modeling has made these structured notes more manageable today than ten years ago, and I think the incremental risk is fairly low.

MR. STARK: One problem we have always had here in the regulatory community, going back to 1993 or 1994 when we wrote the first guidance of structured notes, was the definition of a structured note. What is a "structured note" is not transparent, and that can create a problem.

About a year ago I was speaking to a bankers' group, and I was engaged by the group of bankers about how tough our examiners were being on their structured note holdings. What we discovered had been taking place was that the structured note item in the Call Report was rising very rapidly in a lot of banks, and that this increase had been causing some examiner inquiries, but the type of structured notes banks were buying were relatively short-term, single step-up notes, which are fairly harmless. Because there is a great build-up of liquidity all across the banking sector, but particularly in many community banks, bankers were placing their money in these types of short-term investments, which one could argue are just as safe as a short-term callable bond. These are agency-issued, so there is no significant credit risk associated with them.

So, in September of last year, the FDIC issued some guidance to remind our examiners about the characteristics of structured notes and some of the advantages they have and advising them of the lack of complete transparency in the Call Report filings.

MR. BROWN: We hear an awful lot about the so-called carry trade—the leverage programs that institutions and various types of investors have with playing the yield curve. Currently, short-term interest rates are rising and the yield curve is getting shallower. Are there still concerns about the carry trade and investors or institutions having a problem unwinding those positions?

MS. AZARCHS: My concerns are not so much about unwinding those positions as just the dearth of further opportunities to use those kinds of positions to mismatch just a little bit and get some yield. We have seen the net interest margin in kind of a secular decline. I think actually the worst interest rate environment for banks is a sustained, very low interest rate environment, a bullish flattener kind of environment, where banks just cannot make any money on the free funds or the interest rate spread.

It is almost a relief to see rates start to go up a little bit. A steeper yield curve will probably be better for that profitability opportunity, as long as the mismatch is not outsized.

MR. JOHNSON: I agree with Tanya. I think the carry trade right now is a difficult thing to execute with the yield curve so flat. One of the outcomes that is least favorable to our bank would be either a continued flattening from where rates are or for rates to remain at these current levels. I think the general expectation of the banking industry was to have a little bit stronger increase in rates as we entered 2004, but the yield curve remained fairly flat last year.

I do think there are things banks can do, and one of the things we are doing right now is looking at the

scenario where interest rates remain at these levels and we do not get a strong increase in rates. We are looking at some of the things we can do to help to mitigate the potential impacts on our balance sheet.

One strategy, for instance, is to take a mortgage product, put it on your balance sheet, and not hedge it out for the first year, then use a forward-starting swap to hedge it beyond the first year. You get somewhat of a carry trade for the first 12 months, and you have protected yourself from a flat or down interest rate environment. If rates move up, the hedge protects you after the first year. And if rates rise and you lose some margin on the position, for an asset-sensitive institution there are a number of other things on the balance sheet that will significantly improve the performance of the bank as rates rise.

We are looking at a number of strategies like this as the kinds of opportunities available to us, depending on where we see rates going over the course of the next six months.

MR. STARK: The carry trade really is making money off interest rate risk. Generally, it is mismatching long assets and short liabilities with some kind of overnight repo or something with a longer-dated asset and playing the positive yield curve.

We understand that the business of banking is managing risk at a profit, and this is a form of risk being managed many times by institutions. Hal described a strategy where banks can manage the risk, building a wider spread in the first year and then backing it up after a year with some form of hedge. As regulators, we have no real problems with that. But we need to ensure that everybody in the bank's management and board of directors understands the risks that are being taken by the bank, that the bank has sufficient capital, and that it has sufficient management resources to keep track of the bank's risk positions over time. Interest rate risk is dynamic and can turn around on you.

MR. BROWN: Let's talk about mortgage lenders. With 80 percent of the mortgage loans having been written since 2002, and with a similar percentage of those loans being fixed-rate mortgages, we are clearly in uncharted waters. Are mortgage lenders significantly more at risk for rising rates now than they were five years ago?

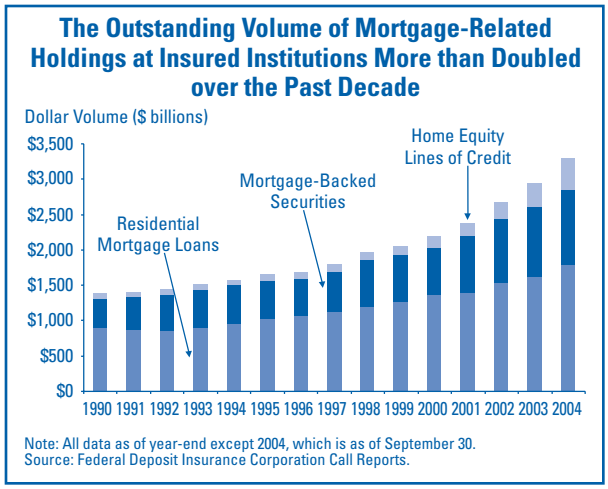
MS. AZARCHS: We do not really think so, although there probably are more mortgage assets as a proportion of total assets on banks' books. But we are told the nature of that risk is not all that different than five years ago. We are told that banks have generally kept the adjustable-rate product on their balance sheet and securitized the fixed-rate product. So the 30-year fixed-rate product is, broadly speaking, not on the balance sheet. [See Chart 2.]

However, the adjustable-rate products are not quite as adjustable as they used to be, with some of the new hybrid products that are around—the three-year, five-year, and seven-year fixed-rate loans that then go to adjustable rates. These hybrids should be fairly easy to hedge, so the real issue goes back to how well they are hedged.

MR. JOHNSON: I do not think that this period is any more risky, and I think the interest rate risk models that are out there do a pretty good job. Certainly, from the ability to hedge there is a full complement of products in the marketplace to use.

I think the risk that exists today is in the potential for a significant disconnect in the prepayment expectations versus the prepayment realities over the next five to seven years. If the hedges and the underlying assets do not end up matching up over that period of time, banks could end up with a portion of their income with either a negative carry or generating a greater benefit. To me, that is the risk.

Chart 2



> ***"Accounting rules clearly do make it difficult for institutions to optimally hedge their risks, and in a significant way."***
>
> ***Hal Johnson***

MR. STARK: I agree. I do not think there is any more risk. There are some micro issues like how to model the newer hybrid products. I imagine getting the models to fully capture the behavioral characteristics of novel, hybrid products to reflect accurately the way they truly behave is a challenge at times for bankers.

MR. BROWN: I would like to move on to deposit pricing, where in the third quarter of 2004 we saw the initial effects of the Federal Reserve raising short-term interest rates. For large banks—with total assets over $10 billion—we saw their cost of funds go up 15 basis points, but for the smallest groups of banks—with assets under $100 million—their cost of funds only went up 2 basis points.

What do you see going forward in terms of the stability of core deposits if the short-term rates continue to increase as anticipated?

MS. AZARCHS: We think that the volume of deposits will remain with the banks, because they have been relatively sticky and have not changed very much in a correlated way with interest rates. The real issue is the pricing on some of the discretionary deposits and deposits in general. I think what we are seeing now is a positive stickiness in pricing in a rising rate environment, where the deposit rates have been a little bit slow to move up.

From the reports we are getting, I think the effect of the interest rate increase has already run its course. They may move up more in lock-step, but the value of the free funds is the thing we are looking to see turn positive as rates continue to move up.

MR. JOHNSON: I think in general core deposits ought to actually be better off with the rates moving up. I think it has been challenging for people to find a home for their money that really earned them much.

We do think that demand deposit account balances will decline, but I am actually surprised that there has not been more of a runoff to this point. So far, our demand accounts have been pretty sticky, but our expectation would be that as rates begin to move up and alternative uses for that cash among our commercial clients improve, we will see some of that money leave the bank.

William Stark (left) and Hal Johnson.

MR. STARK: I find it interesting that banks in the Southeast part of the country appear to be able to lag by maybe 25 percent the Federal Reserve's short-term rate increases. But in the Midwest there is a little more competition for the money, and banks are having to raise their rates. It is interesting to see how rate increases can affect the regions differently. Also, the big banks have a much larger wholesale funding component, so their cost of funding could be going up more dramatically than the community banks and those banks that rely on core deposits.

MR. BROWN: I would like to move on to hedge accounting. I know that there may be some issues out there in terms of the accounting standards applied to hedge positions and whether or not these standards help or hurt the ability to undertake a macro hedging strategy. Is there a sense in which the accounting rules make it difficult for institutions to optimally hedge their interest rate risks?

MS. AZARCHS: Well, I do think the accounting rules make hedging more difficult. There is a sort of a double responsibility that every bank treasurer has—to think about what the real economic hedge is and what the accounting impact of it could be. Some of the more efficient hedging strategies no longer make it in terms of qualifying for hedge effectiveness under FAS 133, as well as the issue of the mortgage servicing rights.

I do think it puts a spoke in the wheel in many cases, and maybe makes banks prefer the less efficient way of hedging, which would be the cash instrument rather than the synthetic derivative expression of the same. Maybe banks do less hedging because of the fear of the accounting. Right now I think the largest risk is the accounting risk, and the fear that it will be misperceived if there is a change in accounting method from hedge accounting to mark-to-market accounting and an attendant loss. That has a very negative effect on shareholders, on the stock market price, and things like that where people just see accounting risk and head for the exits.

MR. JOHNSON: Accounting rules clearly do make it difficult for institutions to optimally hedge their risks, and in a significant way. If you look at accounting for things like the MSR asset, it is totally devoid from the actual cash flow of that asset. Additionally, when you have assets like the MSR asset and commercial mortgage-backed security pipelines, where the hedge is marked to market but the asset remains as the lower of cost or market, it makes the hedging extraordinarily difficult, because you no longer have an economic offset at the end of your accounting period.

"When evaluating the soundness of the bank and the health of its franchise, it is extremely important for us to see what is happening operationally, and that is getting more and more difficult to do."

Tanya Azarchs

So I think the accounting rules do have an impact, and I think they are hurting our ability to effectively hedge and take out the kinds of risk we want to, because we have to be sensitive to the potential accounting outcomes.

MR. STARK: I am not the accountant in the crew here, but I agree with what I hear from Tanya and Hal. It is disturbing when accounting rules and economic reality differ, and it is generally going to lead to a bad result. From a safety and soundness viewpoint, we have an interest in avoiding a bad result, so these are areas that we monitor carefully.

MR. BROWN: Tanya, as an analyst, do these developments make it harder to evaluate the institution?

MS. AZARCHS: It does cause some loss of transparency. Hedge accounting makes it difficult to track what is happening from a cash flow sense, a liquidity sense, or an operational sense. Technically, when we get to full mark-to-market accounting, the income statement will only be the residual reconciliation between the balance sheet at Time A and the balance sheet at Time B. However, when evaluating the soundness of the bank and the health of its franchise, it is extremely important for us to see what is happening operationally, and that is getting more and more difficult to do.

Securitization rules are another area of distortion from what is really happening operationally. All we can see

is the change in the mark-to-market of the residuals, but we do not know what is happening to the pool of assets that underlies that.

MR. BROWN: I want to move on to our bottom line question here, and, for the FDIC, many times the bottom line relates to scenario analysis. There are two interest rate scenarios I would like to consider.

First, let's consider a baseline scenario. Federal funds futures are implying that short-term interest rates will increase another 100 basis points by August and maybe another 50 basis points by the end of the year. So we are anticipating steady, moderate increases in short-term interest rates. What effect is that likely to have on the industry and individual institutions with regard to interest margins, securities gains, and credit quality? Are there any bad outcomes that we should be worried about?

MS. AZARCHS: For Standard & Poor's, one of the first things we think about is what economic scenario goes along with that. Assuming that we are getting a strong economy with good growth in discretionary income, the credit quality problems that could come from rising interest rates may be dampened.

The greatest area of concern is the amount of consumer debt in the high-growth areas of home equity lending and other forms of unsecured or even secured consumer debt. In a high-rate environment, what is going to happen to that from a credit quality point of view? You need to have a really strong economy to offset any potential credit fallout in these areas.

In terms of net interest margin, I think interest rate margins would be slow to recover to their historic norms under what we might call a bearish flattener. If the Federal Reserve raises rates but the long end stubbornly refuses to go up, there is going to be continued pressure on the margin. But I think there would be even more pressure if rates stayed very low and flat, a bullish flattener scenario.

MR. JOHNSON: If we see a continued flattening yield curve, I agree that you have to look at what is happening to the economic scenario. If we do not see more robust loan demand and some relief on asset pricing, that is somewhat of a bearish scenario for 2005 from a bank earnings perspective.

A good outcome would be a steepening yield curve, a little bit more robust economy, more loan demand, and a little less pressure on loan pricing. That is our preferred economic scenario.

MR. STARK: In the supervisory business, we focus on banks' risk management processes given that bank's risk profile, and we try to steer clear of second-guessing bank management's interest rate forecasts. We are concerned primarily about any extreme position in a bank where there is not sufficient capital. We do not differentiate whether it is an extreme long or an extreme short position. If the bank does not have sufficient capital and rates go the wrong way, the bank can get into trouble and may not be acting in a safe and sound manner. That is what we try to evaluate at all times.

MR. BROWN: Let's talk about an extreme case here—the worst case scenario. The United States is running a current account deficit in the neighborhood of $500 billion to $600 billion, and yet we have long-term yields around 4.15 percent today, which is pretty low.

A lot of the slack is being picked up by the purchases of U.S. Treasury and agency securities by foreign central banks, especially in Asia. That represents an official policy that might change at some point if those central banks decided not to accumulate more dollar assets. If that were the case, there is the potential that we could see the dollar decline, and we could see long-term interest rates shoot up pretty dramatically. If long-term interest rates shoot up to 6 or 7 percent, or even higher in some very adverse scenario, what effect would that have on the banking industry? Which institutions are going to be affected the worst, and how?

MS. AZARCHS: When we look at stress tests that banks do in their asset-liability management, we see those types of scenarios being tested to some extent. I think higher rates are survivable as long as the economy does not decline and the asset liability managers hedge appropriately.

What we are not necessarily seeing tested, and I wonder why not, is a stagflation scenario. In a very stagnant, high-unemployment kind of economy, the credit risks in the consumer sector would be extremely large. That is when I think we would see the consumer sector decline.

MR. JOHNSON: I agree. I think it becomes a potential credit issue at that point, and I think the issue of inflation and stagflation is one that we have to keep a very close eye on. If we see those two things beginning to show up on the horizon, we need to be able to react, because neither of them is particularly attractive for banks.

MR. BROWN: I want to thank you all for your willingness to talk about these issues and share your perspectives with us. It has been very interesting and helpful to us here at the FDIC.

Lynne Montgomery provided editorial assistance for this article.

Photographs are by Sally Kearney and Mary Ledwin Bean.

Panelist Profiles

Tanya S. Azarchs

Tanya S. Azarchs is a Managing Director in Financial Services Ratings at Standard & Poor's, where she is responsible for coordinating research on issues affecting financial institutions worldwide. She is also responsible for the ratings of large, complex banks and securities firms in the United States and Canada, and she is involved in the analytical effort regarding Eastern European banks. She is a member of the global financial institutions ratings criteria board, which develops ratings criteria and reviews ratings across the globe for consistency. As a Senior Analyst, she participates in rating committees for banks in many regions of the world.

Ms. Azarchs joined the Financial Institutions Ratings group in 1989 after following the largest U.S. banks as an equities analyst for Standard & Poor's since 1984. Ms. Azarchs holds an M.A. and B.A. in English literature and has done graduate work in finance and comparative literature at New York University. She is a Chartered Financial Analyst.

Hal S. Johnson

Hal S. Johnson is an Executive Vice President in the Funds Management Department of BB&T. Mr. Johnson serves as the asset-liability committee balance sheet manager responsible for BB&T's market risk management, simulation modeling, and Treasury market functions.

Mr. Johnson joined Southern National Corporation in 1984 and was promoted to Marketing Director in 1986. In 1989, Mr. Johnson was tapped to develop a Strategic Planning Department for Southern National. In that capacity he worked with Executive Management and the company's Board of Directors to develop corporate strategy, including acquisition strategy. Mr. Johnson served in a leadership role in the merger-of-equals between Southern National and BB&T. In February 1995, upon consummation of the merger between BB&T and Southern National, Mr. Johnson assumed the responsibilities of Strategic Planning and Corporate Finance Manager for the combined organization. Since then, Mr. Johnson has been involved in more than 100 acquisitions, including 30 banks and thrifts, 53 insurance agencies, and 18 nonbank companies.

Mr. Johnson holds a B.S. in business administration and an M.B.A. from East Carolina University. He is a Chartered Financial Analyst.

William A. Stark

William A. Stark is an Associate Director in the FDIC's Division of Supervision and Consumer Protection where he heads the Capital Markets Branch. He is responsible for policy development and examiner guidance on FDIC-insured institutions' involvement with all securities matters and related risk areas. Mr. Stark works closely with the Federal Financial Institutions Examination Council Supervision Task Force on the development of various policy guidelines. He has been directly involved in the training of bank examiners and industry representatives. In addition, he has served on numerous subgroups of the Basel Committee on Banking Supervision.

Mr. Stark came to the FDIC in 1990 after holding positions as Chief Financial Officer, Controller, and Treasurer of various financial institutions in the United States. Prior to that, he was employed by Peat, Marwick, Mitchell and Company as an audit manager for banks and thrift institutions.

Mr. Stark holds a degree in business administration from the University of Missouri.

Profiles of Depositories Exposed to Interest Rate Risk

Recent increases in short-term interest rates and the likelihood of further rate increases have some market participants concerned about how bank and thrift earnings will respond. These concerns are prompted, at least in part, by the fact that many institutions have increased their relative holdings of longer-term assets, especially mortgages, over the recent period of historically low interest rates.[1] Also of concern are the possible indirect effects of interest rate increases on banks, including the effect of higher debt service costs on the ability of borrowers to repay. Certain types of borrowers, such as those with non-prime and high loan-to-value equity or commercial real estate borrowers whose loans have variable features, may show a greater sensitivity to rises in interest rates.

Quantifying interest rate risk (IRR) is not as straightforward as, say, quantifying credit risk using easily obtainable loan performance measures such as delinquency and loan loss ratios. Accurate modeling of an institution's IRR profile is data-intensive and generally requires more information than is available from financial or regulatory reports. Nevertheless, financial and supervisory data can help isolate many institutions that are potentially vulnerable to rising interest rates. Off-site data can also provide a measure, albeit an imperfect one, of how institutions might perform in a rising rate scenario.

This article describes some general profiles of depositories that may be vulnerable to rising interest rates. It also discusses several reasons why prospects for rising interest rates appear to pose less concern today than during the turbulent interest rate environment of the 1970s and early 1980s. Finally, the article places the discussion of IRR in a historical context by showing how the current regulatory and industry environments compare with those of the 1980s.

[1] For example, the proportion of insured banks holding in excess of 30 percent of their assets in long-term mortgages and securities (those that mature or reprice in more than five years) increased from 9.1 percent at year-end 1997 to 15.8 percent at September 30, 2004.

Factors That Help Profile an Institution Exposed to Rising Rates

For depository institutions, IRR is traditionally defined as the sensitivity of an institution's earnings and net portfolio value to changes in interest rates.[2] Depending on the interest rate environment, these sensitivities arise from the composition and characteristics of an institution's assets, liabilities, and off-balance-sheet positions.[3] This traditional view of IRR can be thought of as margin risk, because excessive IRR exposure most often manifests itself through adverse changes in net interest margins.[4] Margin risk, however, produces an incomplete picture of the potential vulnerability of institutions insured by the Federal Deposit Insurance Corporation (FDIC) to rising interest rates. Two additional factors must be considered: (1) how rising interest rates affect credit quality (repayment risk for the purposes of this article) and (2) the effectiveness of bank management in monitoring and controlling an institution's IRR exposures (management risk).

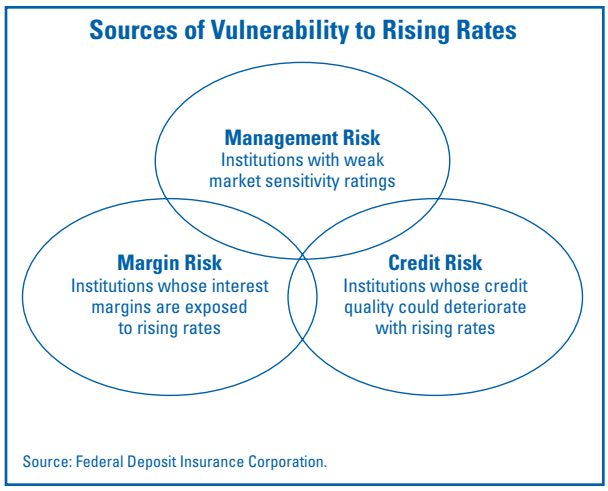
Figure 1 illustrates a conceptual framework for identifying depository institutions along the three risk dimensions of margin, repayment, and management risk. For each risk dimension, asset compositions or supervisory indicators can help identify "outlier" institutions that exhibit characteristics making them relatively more vulnerable to rising interest rates than other institutions. Note that Figure 1 is drawn with overlapping risk dimensions, which implies that some institutions will be identified as outliers in more than one risk dimension. However, the incidence of intersection between two risk dimensions is relatively infrequent, and the

[2] Elizabeth Mays, "Interest-Rate Risk Models Used in the Banking and Thrift Industries," in *The Handbook of Fixed Income Securities*, 4th ed., eds. Frank J. Fabozzi and T. Dessa Fabozzi (Chicago: Irwin Professional Publishing, 1995), 696.

[3] Characteristics that must be considered include the various options (such as the ability to prepay a loan) that are embedded in securities, loans, deposits, borrowings, and off-balance-sheet contracts.

[4] Because changes in net portfolio values reflect changes in earnings power, they too will eventually lead to changes in earnings to the extent that the value changes are permanent. For depository institutions, most valuation changes will flow through the net interest margin. Some valuation fluctuations, such as changes in the value of mortgage servicing rights, flow through noninterest revenues or noninterest expenses.

Figure 1



incidence of intersection among all three risk categories is very rare.

Margin Risk Often Accompanies High Levels of Long-Term Loans and Securities

Margin risk is commonly attributed to a mismatch in contractual maturities or repricing frequencies between assets and liabilities. The interest margins of institutions with a liability-sensitive position (that is, institutions with liabilities repricing more frequently than their assets) tend to benefit when rates fall, because funding costs decline more rapidly than their asset yields. On the other hand, the interest margins of these institutions tend to decline when interest rates rise. Institutions with liability-sensitive balance sheets are often typified by their large proportional holdings of securities and loans with longer-term contractual maturities or infrequent repricing opportunities, such as fixed-rate mortgage loans. A long-term asset ratio, defined as the proportion of loans and securities with remaining maturities or next repricing opportunity exceeding five years, is therefore a simplistic but straightforward way to identify institutions whose margins are vulnerable to rising rates.[5]

Repayment Risk More Likely in Certain Types of Loan Exposures

Conceptually, certain types of credit exposures may be more vulnerable to default in the event of a sharp rise in interest rates, because some borrowers may be unable to satisfy increased debt service requirements due to higher interest payments. In a rising-rate scenario, loans to highly leveraged consumers would appear to pose a risk, particularly for those consumers who hold large volumes of variable-rate debt such as adjustable-rate mortgages, high loan-to-value mortgages, and home equity lines of credit. ***Loan Performance*** data indicate that 60.5 percent of the subprime, closed-end, first- and second-lien mortgages have variable rates, marking this class of loans as being more rate-sensitive than other mortgage portfolios.[6]

Another type of variable-rate loan that could experience a higher rate of default in a rising-rate environment is that of loans secured by commercial real estate (CRE), where repayment is largely project-dependent. In a market where rents are generally under pressure nationwide, rising interest rates have the potential to increase debt service while tending to raise capitalization rates and pressure property values. For both consumer and CRE loans, the repayment capacity of borrowers could be impaired if there is no offsetting increase in income from wages, sales, or rental rates.

There are several factors and considerations that could alleviate repayment risk concerns related specifically to higher interest rates. For example, changes in loan payments on many loan products (variable-rate mortgage loans, in particular) significantly lag changes in interest rates. For such loans, a slow and measured rise in rates should not lead to significantly different loan performance in the near term. In addition, many loan contracts contain provisions that cap how high payments can go in response to increases in market rates.[7] These provisions effectively limit an institution's exposure to repayment risk as defined in this article. Finally, it must be acknowledged that most rising-rate scenarios would be associated with an economic expansion, which would generally bode well for consumer incomes and the ability of CRE borrowers to obtain higher rental rates. Hence, the unlikely scenario of an

[5] This approach is simplistic for a variety of reasons: (1) it ignores the use of derivatives (interest rate swaps and options) to alter the maturity and repricing characteristics of balance sheet exposures; (2) it does not consider the options embedded in certain assets and liabilities, which could also alter the effective duration of assets and liabilities; and (3) it does not consider situations, albeit rare, where institutions have substantially matched these long-term assets with like-maturity funding sources. Despite its shortcomings, the long-term asset ratio is useful in developing a view of the prototypical institution whose margins are vulnerable to rising interest rates.

[6] The subprime, closed-end, first- and second-lien mortgages here include adjustable-rate mortgages, short-term balloon products, and London Interbank Offered Rate (LIBOR)-based mortgages.

[7] Most variable-rate mortgages contain both lifetime and periodic payment caps.

immediate and steep rise in interest rates is where repayment risk becomes most relevant. Nevertheless, the significant increase in high loan-to-value and variable-rate mortgage products, including some interest-only products, may affect repayment risk in this cycle, particularly for those borrowers who have less financial cushion to withstand higher financing costs.[8]

Call Reports and Thrift Financial Reports provide no direct information on the repayment ability of borrowers. These reports also do not contain sufficient information to isolate those loan portfolios where borrowers' payment requirements could be expected to rise materially in the event of higher interest rates.[9] As a result, crude proxies are used to help identify loan portfolios likely to contain either a significant proportion of variable-rate product or significantly higher credit risk in terms of the repayment capacity of borrowers. The kinds of proxies used include proportionally large holdings of subprime mortgages, home equity and other types of consumer loans, and CRE and development loans. Note that there are likely to be relatively few institutions that simultaneously exhibit both a significant degree of repayment risk, which results from holding relatively short-term, variable-rate loans, and a significant degree of margin risk, which stems largely from holding longer-term assets.

Supervisory Ratings Highlight Weak Interest Rate Risk Management Practices

Supervisory assessments of the ability of depository managers to measure and monitor their IRR exposures are perhaps the most critical considerations in this risk identification process. The "S" component of the CAMELS rating assesses the ability of management to identify, monitor, and control *market risk* exposures within a bank or thrift.[10] The rating also encompasses an assessment of the level of earnings and capital that is available to serve as an effective buffer against market risk exposures. Although the term *market risk* also encompasses foreign exchange, equity, and commodity price volatility, it most often manifests itself in the form of IRR. Institutions with a "3" or worse "S" component rating either have identified weaknesses in their market risk controls or have a significant potential to suffer adverse earnings or capital consequences due to their market risk exposures.

Developing a Profile of Institutions Vulnerable to Rising Interest Rates

Using the conceptual framework of the three risks described thus far, it is possible to develop a descriptive IRR profile of institutions that might be vulnerable to rising interest rates. (See inset box for an explanation of the methodology used to construct the IRR profiles used in this article.) Table 1, for example, shows selected average financial measures for the commercial banks defined to have margin, repayment, or management risk.[11] While this rather abstract approach may not be applicable to every individual case, it has the benefit of allowing us to objectively measure relative exposures across institutions.

It is useful to compare these financial measures between groups and with the financial measures of the vast majority of banks (the "All Other Banks" column in Table 1) that do not meet the risk criteria for the three risk dimensions. The following are some key observations from these comparisons:

Margin Risk

- The average, or prototypical, margin risk bank (see definition in Table 1) has a significantly higher proportion of longer-term earnings assets—assets that reprice in more than one year—than other institutions. This institution also tends to hold a significantly higher proportion of its assets in securities. These securities are centered primarily in longer-term Treasury and mortgage-backed securities.

- Because of the heavy investment in securities, the prototypical margin risk bank has proportionally smaller holdings of loans. However, as might be

[8] For more about home equity lending, see "Home Equity Lending: Growth and Innovation Alter the Risk Profile" by Cynthia Angell in *FDIC Outlook*, Winter 2004, http://www.fdic.gov/bank/analytical/regional/ro20044q/na/2004winter_03.html.

[9] For example, other than closed-end loans secured by one-to-four family mortgages, Call Reports do not identify loans with variable-rate payment structures.

[10] All insured depositories are rated under the Uniform Financial Institutions Rating System, which is a six-component system that assesses capital adequacy (C), asset quality (A), management (M), earnings (E), liquidity (L), and market sensitivity (S), or CAMELS. Under this system, examiners assign component ratings as well as a composite rating from "1" to "5," with "1" representing the least degree of risk and "5" representing the greatest degree of risk.

[11] Data in Table 1 represent the unweighted average for the institutions in each bank group.

Table 1

Financial Profile of Commercial Banks Vulnerable to Rising Interest Rates (as of September 30, 2004)

	Margin Risk Banks[a]	Repayment Risk Banks[b]	Management Risk Banks[c]	All Other Banks
Number of banks	1,212	622	312	5,693
Combined assets	$1,951 billion	$457 billion	$137 billion	$5,884 billion
Selected balance components (as a % of assets)				
Securities	34.9	10.4	28.0	22.8
Total loans	55.2	79.8	58.6	64.1
Noncore deposits	11.5	17.1	14.4	12.7
FHLB advances	6.1	4.0	5.6	3.5
Equity	11.0	10.9	10.4	11.8
Assets repricing in more than 1 Year	68.3	44.5	55.1	49.6
Selected earnings measures (%)				
Net interest margin	3.9	4.5	3.8	4.1
Return on assets	1.1	1.3	0.4	1.1

[a] Margin risk banks are those with long-term loans and securities greater than 30 percent of assets. Long-term assets include loans and securities with contractual maturities or a next repricing in excess of five years.

[b] Credit risk banks are those with either a large proportion of their assets in non-prime loans, greater than 50 percent of their assets in CRE or construction loans, or greater than 50 percent of their assets in mortgage and consumer loans.

[c] Management risk banks are those with weak market sensitivity, or "S" component ratings ("3" or worse).

Note: All numbers in the table are within-group, unweighted averages.

Source: Federal Deposit Insurance Corporation Call Reports.

expected, its holdings of residential mortgages are proportionately higher than those of other banks.

Repayment Risk

- The average repayment risk bank is significantly more "loaned-up" than other institutions. Moreover, as the risk criteria used to develop this bank suggest, its loans tend to be heavily centered in higher-risk lending categories such as CRE and construction loans. These banks also tend to have somewhat higher levels of home equity and credit card lending.[12] Not surprisingly, because these banks have a greater concentration of higher-risk loans, the net interest margin of repayment risk banks is the highest of the commercial bank group used in this analysis. The coexistence of higher margins (and therefore lower margin risk) and higher repayment risk within this group suggests a trade-off between these dimensions of risk that would tend to reduce the total IRR of these institutions.

- Funding sources among these groups of banks are somewhat similar. However, the prototypical repayment risk bank tends to fund itself with more noncore deposit sources, whereas the prototypical margin risk bank funds itself with somewhat higher levels of Federal Home Loan Bank (FHLB) advances.[13] Generally, however, all three risk groups have higher concentrations of noncore funding and noncore deposits and FHLB advances than all the other bank categories.

Management Risk

- Equity and earnings levels are weakest at the prototypical management risk bank.

A review of the examination findings related to banks with weak market sensitivity ratings reveals additional

[12] The balance sheets of institutions engaged in non-prime lending activities are heavily concentrated in consumer lending, which includes home equity and credit card loans.

[13] Noncore deposits include time deposits greater than or equal to $100,000, brokered deposits, and foreign deposits.

Methodology Used to Construct IRR Profiles

For analytical purposes, the criteria set forth below were used to develop an "average," or prototypical, bank for each of the three bank risk groups identified by margin risk, repayment risk, and management risk. Performance measures and financial ratios for each bank group and the group of "All Other Banks" are provided in Table 1. Financial measures represent the unweighted average statistic for the banks within each group.

Risk Criteria for Bank Groupings

Margin risk banks are commercial banks with long-term loans and securities greater than 30 percent of assets. Long-term assets include loans and securities with contractual maturities or with a next repricing date in excess of five years.

Repayment risk banks are commercial banks with a large proportion of assets centered in non-prime loans (identified with nonpublic examination information), commercial banks with greater than 50 percent of their assets centered in CRE or construction loans, or banks with greater than 50 percent of assets centered in mortgage and consumer loans.

Due to lack of available loan and borrower data, it is difficult to identify all institutions that may experience repayment risk in a rising-rate environment. For this exercise, the selected banks had higher concentrations of variable-rate, subprime loans and CRE and construction loans that exhibited the most pronounced vulnerability to higher interest rates in the current environment. Other consumer-oriented institutions were included on the list of identified subprime lenders, as many also hold small portfolios of non-prime loans to the repayment risk group.

Management risk banks are those with weak market sensitivity, or "S" component ratings ("3" or worse).

Simulation Test

The second phase of the analysis simulated the effect of two scenarios of higher interest rates on the prototypical management risk bank. The prototypical management risk bank is constructed using the average ratios calculated from the entire management risk bank group. The two alternative interest rate scenarios are (1) an immediate 300-basis-point rise in short-term interest rates and (2) a 500-basis-point rise in short-term interest rates. Each rate shock is assumed to be permanent throughout the two-year simulation period. The simulation consists of a simple pro forma extrapolation of year-to-date 2004 earnings for two additional years under these rate-shock scenarios. The result of this simplified simulation on the management risk banks is provided in Table 2.

shared characteristics that can be included in the IRR profile. Specifically, these institutions tend to have weak IRR monitoring systems combined with weak earnings and capital. Because of their weak earnings and capital positions, they are less able to withstand any volatility in earnings prompted by changing interest rates. Such characteristics are most problematic when found in conjunction with capital leveraging programs or lending activities concentrated in mortgage or non-prime lending.[14]

Most Banks and Thrifts Could Withstand a Significant Near-Term Rise in Interest Rates

To illustrate how IRR can affect earnings and capital, consider the simple stress simulation in Table 2. This simulation uses Call Report maturity and repricing information to measure incremental changes in earnings for the prototypical management risk bank described in Table 1. Note that even when this proxy institution is subjected to an immediate rise in short-term rates of 500 basis points, its capital falls only slightly from 10.4 percent to 9.9 percent over a two-year projection period. Granted, such an extreme change in rates would have significant valuation implications as well. However, capital levels of this prototypical bank should serve as sufficient protection against net reductions in the value of its equity.[15]

[14] A capital leveraging program describes a strategy to enhance overall earnings returns by funding lending and securities investment programs with more volatile or noncore funding sources.

[15] The Office of Thrift Supervision's *Quarterly Review of Interest Rate Risk* gives some sense of the possible magnitude of such valuation changes. For example, in its second quarter 2004 report, a 300-basis-point increase in rates resulted in a 30 percent reduction, in aggregate, in the market value of thrifts' net worth. If the asset and liability structure of the prototypical management risk bank is presumed to be similar to that of thrifts, then the bank's equity-to-asset ratio would decline to 7.28 percent on a market-value basis following the 300-basis-point rate shock. A 500-basis-point rate shock would produce a somewhat greater reduction in equity capital on a market-value basis but probably not of magnitudes that would suggest insolvency (in market-value terms).

Table 2

Year 2 Pro Forma Earnings of a Prototypical Bank with Weak Market Sensitivity Ratings Following an Immediate Rate Shock (data as of September 30, 2004)

	Unstressed Results (%)	300-Basis-Point Rise (%)	500-Basis-Point Rise (%)
Net interest margin	3.84	3.23	2.82
Return on assets	0.42	0.01	–0.26
Equity to assets	11.11	10.41	9.94

Methodology:

This exercise quantifies incremental changes in year-to-date 2004 margins and overall earnings given changes in earning asset yields and funding costs due to an immediate increase in interest rates. To measure the incremental change in interest earnings and costs, the maturity and repricing information in the Call Reports was used.

Key Assumptions:

- Rate changes reflect immediate changes in short-term rates and are permanent through the projection period.
- Changes in loan yields presume reinvestment/repricing into long-term loans and a narrowing of the yield curve.
- Changes in securities yields presume reinvestment/repricing into medium-term securities and a narrowing of the yield curve.
- Changes in funding costs for certificates of deposit, other borrowings, and short-term funding presume replacement of funding at short-term rates.
- Changes in money market deposit accounts, savings, and transaction account costs are derived from a regression of historical changes in the cost of these funds (over a four-quarter period) relative to changes in federal funds rates.
- Off-balance-sheet hedges and contractual options embedded in earnings assets (such as the right to prepay loans or call securities) or funding costs are not considered.
- Asset and liability levels as well as the mix of assets and liabilities are assumed to remain static over the two-year projection period.

Source: Federal Deposit Insurance Corporation Call Reports.

The main point illustrated by these simulation results is that IRR would appear to manifest itself as an earnings-related issue over the near-term rather than a solvency issue for the vast majority of FDIC-insured institutions. Even in such situations, a more critical concern is often how management responds to reduced earnings margins. If management chooses to invest in higher-risk investments to restore its margins, then solvency could become an issue when these investments fail to perform and the institution experiences higher investment-related losses.

Finally, IRR can reduce or impair the ability of institutions to withstand financial adversity produced through a confluence of risk events. One of the more striking examples of this point was the performance of the thrift industry during the 1980s. During this period, declining interest margins largely eliminated the ability of many thrifts to absorb a substantial rise in real estate credit losses through earnings.

Interest Rate Risk Faced by Depositories Today Should Be Viewed in Historical Context

Although it is worthwhile to define characteristics of institutions exposed to rising interest rates, it should be recognized that IRR may not pose the same degree of risk to FDIC-insured depositories that it did some 20 years ago. The following are some of the main reasons why today's banks and thrifts, even those falling within the high-risk profiles described previously, are better able to withstand interest-rate shocks than institutions in the early 1980s:

- **Tools and techniques have improved.** The market for financial products and services has evolved to provide banks and thrifts more options to control and reduce IRR. Because of the expanding depth of markets for such products as asset-backed securities and derivatives, depositories have the ability to securitize or hedge exposures that create undesirable IRR

more cost-effectively than would be the case with less developed markets.

- **The regulatory environment has changed significantly.** During the 1980s and early 1990s, the regulation of banks and thrifts was undergoing significant change. The thrift industry was deregulated with the Depository Institutions Deregulation and Monetary Control Act of 1980 (which removed Regulation Q restrictions on interest paid on deposits) and the Garn-St. Germain Act of 1982. In the early 1990s, tighter investment and Prompt Corrective Action rules were imposed with the Financial Institutions Reform, Recover, and Enforcement Act of 1989 and the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991. Today's regulatory environment for financial services in the United States is arguably far less turbulent, as evidenced by the relatively small number of bank and thrift failures since 1994.

- **Capital positions are much stronger.** In the aftermath of FDICIA and newly implemented risk-based capital rules (Basel I), institutions today have a significantly higher buffer of capital with which to absorb financial shocks relative to their financial position than 20 years ago. For example, the equity-to-asset ratios of thrifts and banks averaged 4.2 percent and 6.2 percent, respectively, during the latter half of the 1980s. Today, thrifts and banks maintain an average equity-to-asset ratio of 9.2 percent and 9.4 percent, respectively.

Though IRR may pose less of a solvency threat to FDIC-insured depositories today than it has in the past, both banks and supervisors continue to monitor it closely. IRR can place significant downward pressure on margins and overall earnings if not properly managed. In such cases, supervisors may respond by downgrading one or more of a bank's CAMELS ratings, including the market sensitivity rating. Accordingly, it is not surprising that weaknesses in IRR management and weak earnings go hand-in-hand. Referring back to Table 1, note that the annualized return on assets of commercial banks with weak market sensitivity ratings ("S" ratings of "3" or higher) as of September 30, 2004, was only 0.43 percent—70 basis points lower than that of banks with satisfactory or better market sensitivity ratings.

Conclusion

An institution's vulnerability to rising interest rates can be viewed along three different risk dimensions: margin risk, repayment risk, and management risk. Defined along these risk dimensions, the prototypical institution with exposure to rising rates is one with either a proportionally large volume of long-maturity assets or a proportionately high volume of adjustable-rate loans to highly leveraged consumers or collateralized by CRE. Moreover, institutions with weak IRR controls and practices often display weak earnings and reduced capital levels.

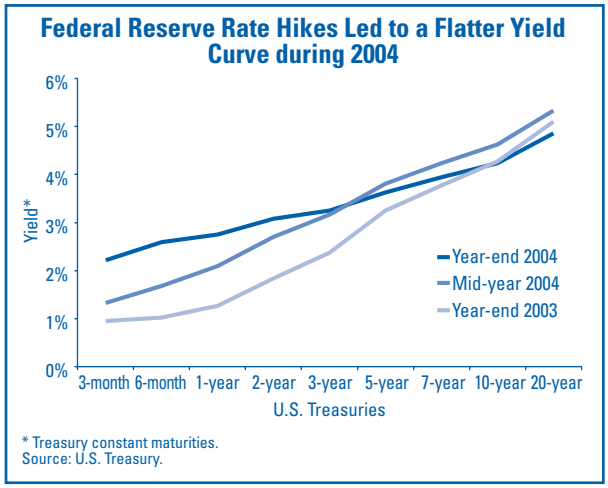
Although IRR in general appears to pose less of a risk to the industry than it did 20 years ago, it remains a critical risk assessment factor in the supervisory process. Through 20 years of FDIC failure experience, supervisors of depositories have seen how IRR can compound safety and soundness issues. If left unchecked, weakened earnings attributable to uncontrolled IRR could leave an institution vulnerable to other problems, so how management reacts to IRR-related weaknesses in earnings margins is often more important than the underlying IRR position of the institution.

Steven Burton, Senior Financial Analyst

Rate/Volume Analysis: An Off-Site Approach to Measuring Interest Rate Risk

Interest rate risk (IRR) is the exposure of a bank's current or future earnings and capital to interest rate changes.[1] One method of assessing the level of IRR, or the sensitivity of an institution's earnings to changing interest rates, is by using rate/volume analysis (RVA). RVA is an effective, after-the-fact, off-site monitoring technique that measures IRR by analyzing the separate components of net interest income (NII) over a specific time period. (See the inset box for more on the basics of RVA.) In addition, RVA helps identify outlier institutions where changes in interest rates significantly affect NII. Using the RVA method, this article assesses the level of IRR among institutions insured by the Federal Deposit Insurance Corporation (FDIC) across the country during the 12-month period ending September 30, 2004.

Chart 1



Background

After two years of the lowest federal funds rates since the late 1950s, short-term rates began to rise in June 2004 when the Federal Reserve's Federal Open Market Committee (FOMC) raised the federal funds target interest rate a quarter point to 1.25 percent. During the remainder of 2004 the federal funds target rate was raised four more times, closing the year at 2.25 percent. In contrast, 10-year Treasury notes fluctuated within a band of between 4.73 percent and 4.10 percent during the same six-month period, ending the year at 4.23 percent, which was slightly below year-end 2003 levels.[2] Taken in combination, the changes in short- and long-term interest rates during the year resulted in a modestly flatter yield curve by the end of 2004 (see Chart 1). The yield curve spread, defined as the difference between the yields on the 10-year Treasury bond and the 3-month Treasury bill, declined from a high of 368 basis points at May 2004 to 201 basis points by year-end 2004.[3]

Typically, a flattening yield curve tends to compress net interest margins (NIMs) for financial intermediaries. However, despite a moderately flatter yield curve, NIMs actually improved at the majority of the nation's community banks.[4] During the first nine months of 2004, 52 percent of community banks reported margin improvement, up from 27 percent a year earlier.

The improvement in NIMs during the recent period of a flattening yield curve may be the result of a number of factors. First, this analysis is through third quarter 2004 and represents only one-quarter of increases in the federal funds rate; further, only one increase was effective for the entire period. (Generally, there is a lag between rising market rates and increases in funding costs for some institutions, so the effects of the rate hike may not yet be fully reflected in funding costs.) In addition, the rise in the federal funds rate has taken place gradually at what FOMC statements have termed "a measured pace," which means that the increases were relatively modest and widely anticipated by financial market participants. Further, despite recent flattening, the yield curve spread of 201 basis points at year-end 2004 remained relatively steep and above its 20-year average of 180 basis points. The yield curve may need to flatten more significantly before there is a pronounced negative effect on community bank NIMs.

[1] IRR includes repricing risk, basis risk, yield curve risk, option risk, and price risk. For more information, see the *Federal Deposit Insurance Corporation Manual of Examination Policies,* http://www.fdic.gov/regulations/safety/manual/index.html.

[2] Based on monthly average data for the 10-year U.S. Treasury note.

[3] Treasury yields represent monthly averages.

[4] Community banks consist of all FDIC-insured institutions with assets of less than $1 billion and exclude credit card and other specialty institutions as well as de novo institutions.

Rate/Volume Analysis: The Basics

In an effort to assess the impact of interest rate changes on NII, RVA analyzes an institution's change in NII by separating it into three components: changes in yields and costs (*rate variance*), fluctuations in volume of earning assets and interest-bearing liabilities (*volume variance*), and residual interest income and expense arising from the combination of rate and volume changes (*mix variance*). Conceptually, RVA follows a performance attribution methodology by breaking down NII into its components and then measuring the contribution of each component during a given period. RVA can be applied to any two consecutive periods (see Table 1).

Table 1

Rate/Volume Analysis Methodology

Variance Measures	Formula Components
Income rate variance	(3Q2004 earning asset yield less 3Q2003 earning asset yield) times 3Q2003 average earning assets
Expense rate variance	(3Q2004 cost of funds less 3Q2003 cost of funds) times 3Q2003 average interest-bearing liabilities
Income volume variance	(3Q2004 average earning assets less 3Q2003 average earning assets) times 3Q2003 earning asset yield
Expense volume variance	(3Q2004 average interest-bearing liabilities less 3Q2003 average interest-bearing liabilities) times 3Q2003 cost of funds
Income mix variance	(3Q2004 average earning assets less 3Q2003 average earning assets) times (3Q2004 yield less 3Q2003 yield)
Expense mix variance	(3Q2004 average interest-bearing liabilities less 3Q2003 average interest-bearing liabilities) times (3Q2004 cost less 3Q2003 cost)

Note: The "net" position for each of the variance measures is the difference between the income and expense variances. For example, the net rate variance is equal to the income rate variance less the expense rate variance. The sum of the three net variance measures (rate, volume, and mix) should equal the total change in net interest income during the period.

Source: Federal Deposit Insurance Corporation.

RVA is just one analytical tool to evaluate IRR in the banking system. Although RVA is an excellent tool for assessing how interest rate changes affect the components of NII, it is limited in its ability to forecast future results. These limitations arise from a reliance on historical data as well as the potential for change in a bank's asset and liability mix over time. Regardless of the results of RVA for a past period, either balance-sheet repositioning or changes in the level or direction of interest rates could alter the degree and direction of IRR risk in future periods. In addition, RVA is limited in its ability to handle off-balance-sheet items.

Results of Rate/Volume Analysis

As of September 30, 2004, a trailing four-quarter RVA on the nation's community banks indicates that the interest rate environment had a nearly equivalent influence on asset yields and liability costs. These data suggest that the IRR exposure of the average community bank during the past year was relatively limited. The average asset yield of community banks fell 44 basis points to 5.62 percent, while the interest-bearing liability cost fell by an almost equivalent amount, 45 basis points, to 1.84 percent. As a result, the net interest spread for community banks remained relatively stable at 3.79 percent during the period.[5] Robust growth in earning assets, particularly in commercial, construction, and residential real estate loans, contributed to the increase in interest income (see Table 2).

[5] The net interest spread is calculated slightly differently from NIM. The net interest spread equals [interest income divided by average earning assets] less [interest expense divided by average interest-bearing liabilities]. The NIM equals [interest income divided by average earning assets] less [interest expense divided by average earning assets].

Table 2

An Interest Rate/Volume Analysis Indicates Little Interest Rate Risk Was Prevalent at Community Banks during 2004

	4 Quarters Ending 9/30/2003			4 Quarters Ending 9/30/2004			Rate/Volume Analysis			
	Average Balance ($)	Income/ Cost ($)	Rate (%)	Average Balance ($)	Income/ Cost ($)	Rate (%)	Volume ($)	Rate ($)	Volume/ Rate ($)	Total ($)
ASSETS										
INTEREST-EARNING ASSETS										
Short-Term Investments:										
Interest-bearing deposits	12,465,622	235,472	1.89	11,133,288	194,035	1.74	–25,167	–18,217	1,947	–41,437
Securities (includes United States, mortgage-backed securities, subdivision, equities)	230,463,431	9,339,732	4.05	255,868,829	9,544,735	3.73	1,029,576	–742,701	–81,872	205,003
Federal funds sold/repurchased	38,381,810	450,144	1.17	30,335,311	317,325	1.05	–94,370	–48,648	10,199	–132,819
Trading assets	95,974	3,917	4.08	64,710	2,264	3.50	–1,276	–559	182	–1,653
Total short-term investments	281,406,836	10,029,265	3.56	297,402,138	10,058,359	3.38	908,763	–810,124	–69,545	29,094
Loans:										
Real estate	459,968,718	31,789,935	6.91	516,309,348	32,638,956	6.32	3,893,884	–2,712,602	–332,261	849,021
Agriculture	26,815,372	1,837,382	6.85	26,675,989	1,725,667	6.47	–9,550	–102,698	534	–111,715
Commercial & industrial	107,605,511	7,504,588	6.97	114,569,897	7,578,985	6.62	485,708	–386,308	–25,002	74,397
Consumer	58,952,463	5,255,430	8.91	57,263,410	4,731,651	8.26	–150,574	–384,213	11,008	–523,779
Total loans	664,700,220	46,957,306	7.06	727,200,873	47,234,409	6.50	4,415,317	–3,782,548	–355,667	277,103
Lease Financing Receivables	3,170,310	251,655	7.94	3,208,173	240,122	7.48	3,005	–14,367	–172	–11,533
TOTAL INTEREST-EARNING ASSETS	949,277,366	57,503,300	6.06	1,027,811,184	57,799,612	5.62	4,757,254	–4,120,087	–340,855	296,312
LIABILITIES										
INTEREST-BEARING LIABILITIES										
Interest-Bearing Deposits:										
Transaction accounts	93,180,729	785,716	0.84	100,599,189	665,802	0.66	62,554	–169,012	–13,456	–119,914
Nontransaction accounts										
Savings deposits (including money market deposit accounts)	250,830,173	2,900,633	1.16	285,435,790	2,575,703	0.90	400,184	–637,203	–87,911	–324,930
Time deposits > $100,000	128,850,970	3,826,251	2.97	138,552,362	3,408,348	2.46	288,084	–656,554	–49,433	–417,903
Time deposits, all others	255,584,260	8,076,314	3.16	251,126,435	6,472,930	2.58	–140,865	–1,488,481	25,962	–1,603,384
Federal Funds	17,750,355	244,710	1.38	21,955,977	270,602	1.23	57,980	–25,941	–6,146	25,892
Other Borrowed Money	45,278,892	2,232,537	4.93	54,732,243	2,247,923	4.11	466,110	–372,875	–77,849	15,386
TOTAL INTEREST-BEARING LIABILITIES	791,988,786	18,098,165	2.29	853,133,579	15,671,644	1.84	1,397,253	–3,549,721	–274,053	–2,426,521
CHANGE IN NET INTEREST INCOME	157,288,580	39,405,135	3.77	174,677,605	42,127,968	3.79	3,360,001	–570,366	–66,802	–2,722,833

Notes: Community banks are commercial banks with assets of $1 billion or less. For this analysis, the sample was limited to community banks open since September 30, 2001, and excludes specialty banks. Subcategories will not always sum to the total since detail on minor categories may not be listed.

Source: Federal Deposit Insurance Corporation Call Reports (merger-adjusted).

Table 3

Community Banks Displaying High Interest Rate Sensitivity (during the four quarters ending 9/30/04)

	Community Banks Reporting a Large Negative Reaction (%)	Community Banks Reporting a Large Positive Reaction (%)	Total of All Community Banks Reporting a High Sensitivity (%)
San Francisco	1.7	3.3	5.0
Dallas	1.4	3.4	4.8
New York	1.5	2.5	4.0
Chicago	1.1	2.5	3.6
Kansas City	1.4	1.8	3.2
Atlanta	0.9	2.2	3.1
Memphis	1.1	1.3	2.5
Boston	0.8	1.2	2.0
Nationwide	1.2	2.4	3.6

Note: *Sensitivity* is defined as net rate variance exceeding 20 percent of the prior four quarters' net interest income. This variance reflects reaction to the specific interest rate environment for a particular period. Different banks will likely display high sensitivity during differing rate movements.

Source: Federal Deposit Insurance Corporation.

Only a small subset—about 3.6 percent of the 6,904 institutions analyzed—displayed a high level of sensitivity to rate movements during the period (see Table 3).[6] Of these institutions, approximately one-third reported a negative earnings reaction, whereas the earnings of the remaining "highly sensitive" institutions reacted *favorably* to recent interest rate changes. Geographically, community banks in the FDIC's San Francisco and Dallas Regions reported the highest percentage of highly sensitive banks, and the Boston area reported the lowest percentage. Despite these differences, the percentage of highly sensitive institutions during this period was low—below 5 percent—in every FDIC region.[7]

Conclusion

Overall, this RVA analysis indicates that little IRR was prevalent among community banks, at least over the past year. For the most part, asset yields and liability costs of community institutions generally have moved in tandem with the changing rate environment, with increases in earning asset volume helping to raise NII. Even among the small group of institutions highly sensitive to rate movements, only one-third reported an adverse reaction to this rate environment, with the remainder reporting an improvement in spread income. Notwithstanding, this analysis represents an aggregate analysis of the nation's community banks, and vulnerability to changes in interest rates will vary among individual institutions.

Ronald Sims II, CFA, Senior Financial Analyst

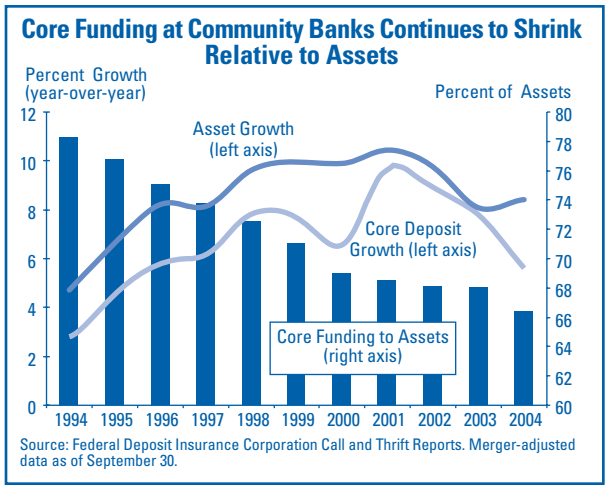
[6] For this analysis, interest-rate-sensitive banks are defined as those banks where the net rate variance exceeded 20 percent or more of prior period NII. See Table 1 for a definition of net rate variance.

[7] Geographical variations reflect differences among individual institutions over this specific time period. Results will change during different interest rate periods.

Funding Asset Growth in a Rising Rate Environment: National and Regional Perspectives

Funds management is a constant challenge for institutions insured by the Federal Deposit Insurance Corporation (FDIC) that becomes even more challenging and important during periods of rising interest rates. The federal funds rate rose throughout the second half of 2004, and the consensus estimate is for more increases in 2005.[1] Rising short-term rates in a strengthening economy may alter the competitive landscape for core deposits, which remain a large but decreasing share of total bank funding. Should asset growth intensify as economic fundamentals improve, banks will have to focus more attention on funding strategies. This article explores national funding trends against this backdrop and highlights regional variations seen among FDIC-insured institutions.

Chart 1



Source: Federal Deposit Insurance Corporation Call and Thrift Reports. Merger-adjusted data as of September 30.

Asset Growth Continues to Outpace Core Deposit Growth at Community Banks

During the past decade, greater competition for traditional deposits among FDIC-insured institutions and other financial intermediaries has contributed to an increased reliance on noncore funding by community banks.[2] This long-term trend of declining levels of core deposits in relation to total assets appears likely to persist (see Chart 1).[3]

In recent years, the banking industry has experienced relatively healthy core deposit trends, with community bank core deposit growth exceeding 7 percent in three of the past four years. Factors that may have contributed to higher core deposit and certificate of deposit (CD) growth include higher growth in gross domestic product, changes in interest rates, growth in corporate profits, growth in disposable income, the total return of the S&P 500, and growth in median housing prices.[4] Interestingly, although deposit growth has been relatively strong, assets have grown faster still, thereby putting pressure on FDIC-insured institutions to increase their use of noncore funding sources. With the recent rebound in equity market performance, core deposit growth has begun to slow, which could contribute to increased use of alternative funding.[5]

With the increasing reliance on noncore funding by the industry, community banks have been trending toward liability structures that more closely resemble those of larger institutions—that is, funding a larger percentage of assets through noncore funding. In the past decade, the difference between large and small institutions has narrowed. Ten years ago, noncore funding represented only 13 percent of total community bank assets. As of September 30, 2004, that figure had almost doubled to 24 percent of assets. Nevertheless, the ratio of noncore funding to assets at large banks remains significantly higher at 41 percent of assets.

[1] According to the February 1, 2005, issue of *Blue Chip Financial Forecasts*, the consensus estimate for the average federal funds rate is 3.6 percent for fourth quarter 2005.

[2] *Community banks* are defined here as both banks and thrift institutions with less than $1 billion in assets, excluding new institutions (those established within the past three years) and specialty lenders such as credit card banks. *Noncore funding* generally consists of large time deposits (greater than $100,000), borrowings, brokered deposits, federal funds purchased, repurchase agreements, and foreign deposits.

[3] *Core deposits* are defined as checking, savings, and money market accounts as well as certificates of deposit less than $100,000.

[4] Michael Mayo, "Are Deposits Hitting an Inflection Point?" Prudential Equity Group, LLC, January 14, 2005.

[5] Merger-adjusted community bank loan growth spiked from 7 percent to 12 percent from third quarter 2003 to third quarter 2004. If sustained, this loan growth may foreshadow stronger asset growth, as institutions may initially fund loan growth through the liquidation of marketable assets.

Community Banks Are Increasing Their Use of Alternative Funding Sources

For community banks, the most noteworthy funding trends have been increased use of Federal Home Loan Bank (FHLB) borrowings and brokered deposits. Although the banking industry overall has not reported an increase in FHLB borrowings relative to total assets during the past three years, more community banks have turned to this funding source. As of September 30, 2004, 61 percent of community banks reported the use of FHLB borrowings, up from 52 percent three years earlier. The availability of FHLB credit has generally been positive for FDIC-insured institutions, as many small banks without easy access to capital markets can tap into this source of funds.

The use of brokered deposits also has increased among FDIC-insured institutions, even though this form of funding is typically of higher cost and more sensitive to interest rate movements than core deposits. In 2004, 25 percent of community banks reported the use of brokered deposits, up from only 8 percent ten years ago and 16 percent three years ago. Although more institutions are using this funding source, the percentage of brokered deposits to assets remains relatively low; only 4.5 percent of large bank assets and 2.3 percent of community bank assets are funded this way.

If properly administered, such diversification of funding sources can benefit FDIC-insured institutions. The increased use of noncore funds can also enable a more precise structuring of liabilities than can be obtained primarily through changes in core deposit pricing. For instance, many institutions have found that brokered deposits can be a more cost-effective deposit-gathering mechanism than building new branches.

Community Banks Continue to Experience Changing Depositor Preferences

Since 2001 community banks have seen a shift in deposit maturities, a trend likely to continue as interest rates climb. As the percentage of time deposits maturing in more than one year increased from 22 percent of all time deposits in 2001 to 33 percent in 2004, all time deposits fell from 40 percent to 35 percent of assets. During the same period nonmaturity deposits increased by an equal amount, from 42 percent of assets to 47 percent of assets.[6] These shifts highlight how depositor preference can fluctuate during periods of changes in interest rates or other market factors. Part of the shift toward nonmaturity deposits could reflect a flight to quality, as some customers may have sought to avoid turbulent equity markets and also perceived low opportunity costs associated with short-term deposits given historically low inflation as well as low interest rates.

As bankers well know, managing depositor preference is a dynamic process. If depositors expect recent interest rate increases to continue, they will have less incentive to lock up funds for a longer duration, which may lead bank managers to alter deposit pricing or reposition the maturity structure of their noncore funding sources.

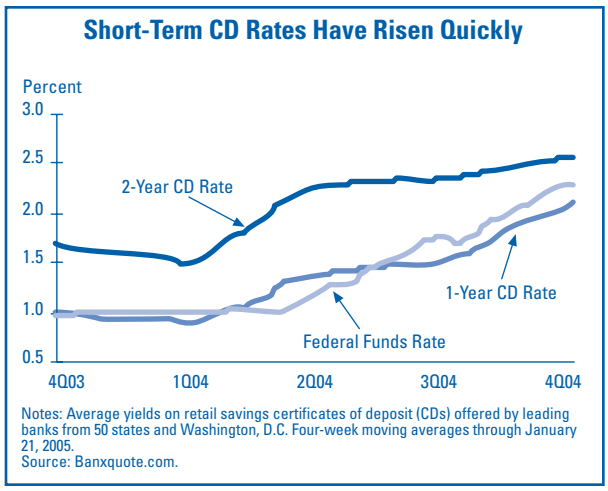
Funding Costs Remain Sensitive to Interest Rate Movements

Typically, there is some lag time between changes in market interest rates and rates offered on bank deposits. This pricing lag is a function of the repricing schedule of deposits, management's deposit pricing strategy, and customer preferences. Part of the time lag arises from the fact that core deposit customers often consider factors other than interest rates when choosing where to bank, including the convenience of banking services and the extent and satisfaction of their current banking relationship.

Early indications suggest, however, that banks may be finding it difficult to hold deposit rates steady in this rising rate environment. Given that retail deposit customers have endured a lengthy period of very low interest rates and short-term interest rates have risen quickly of late, these customers may now be more yield-conscious. For instance, a nationwide index of CD rates suggests that short-term CD rates began moving upward even before the initial rise in the federal funds rate (see Chart 2). Although deposit rates will vary across geographic markets and reflect the intensity of competition for local deposits, it appears that core deposit competition will remain strong and that funding costs will be sensitive to higher interest rates. Bank Call Report data suggest that the cost of funding is beginning to rise in

[6] *Nonmaturity deposits* include transaction, savings, and money market demand accounts.

Chart 2



response to rising short-term rates. The target federal funds rate first moved upward by 25 basis points at the end of June 2004, with further 25 basis point increases in both August and September. Community banks' cost of funding earning assets rose slightly, from 1.55 percent in second quarter 2004 to 1.60 percent in the third quarter.

Funds Management Assumptions May Need Revisiting

The assumptions banks make about the rate sensitivity of their deposits, which are crucial inputs in interest rate risk management, may need to be revised in this interest rate cycle. Special consideration to the interest rate sensitivity of core deposits is warranted, as these assumptions are critical in the interest rate risk monitoring systems of most banks. Furthermore, heightened use of noncore funding, while often beneficial, can come at a cost. Often, this kind of funding will exhibit increased interest rate sensitivity or contain embedded options that can be difficult to value.

In addition, continued strong growth in loans outstanding and unfunded commitments have the potential to generate significantly increased funding needs for FDIC-insured institutions. During the past ten years, the ratio of unfunded commitments to assets nearly doubled, with the median level reaching 9 percent of assets in 2004. As banks and thrifts may not always be able to accurately anticipate the amount of loan draws that will take place, large unexpected draws over a short period of time could pressure bank funding needs.

The remainder of this article highlights some of the most significant funding issues and trends occurring regionally, with commentary from analysts in each of the eight FDIC regional and area offices.

Mike Anas, Senior Financial Analyst

The Fastest-Growing Institutions in the Southeast Are Also the Biggest Users of Noncore Funding

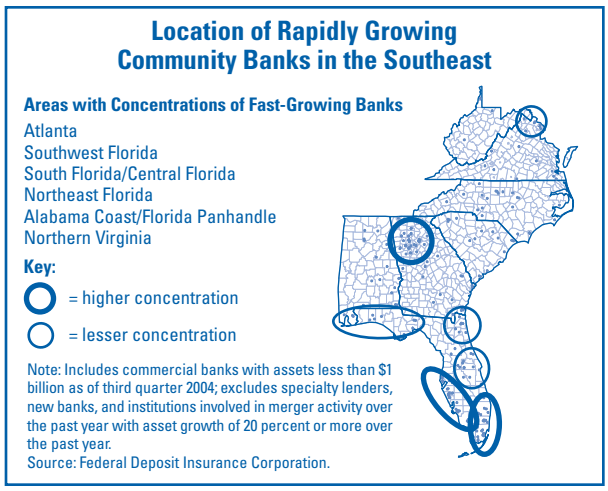
The decline in the ratio of core deposits to total funding has been most pronounced in Atlanta Region community banks that have displayed high rates of asset growth. In fact, during the first nine months of 2004, some 29 percent of community banks headquartered in the Region reported particularly strong asset growth. These "fast-growing" banks had asset growth exceeding 20 percent year-over-year (see Map 1).[7] To accommodate this growth, these banks have turned to alternative sources of funding, especially in active real estate markets where competition for core deposits has heightened because of new market entrants. While the increased availability of noncore funding has enabled many institutions to fund robust asset growth, the use of noncore funding does come at a cost, typically in the form of higher interest expenses.

In third quarter 2004, combined borrowings and noncore deposits represented 36 percent of the total funding of fast-growing banks, compared with 31 percent for other community banks. Fast-growing banks also reported higher funding costs, which contributed to narrowing net interest margins (NIMs). A diminished reliance on core deposits also may reflect the fact that 20 percent of the fast-growing banks are new institutions that face the high overhead costs typically associated with penetrating competitive deposit markets.

Although fast-growing banks can be found throughout the Region, the largest clusters are in the three key market areas of **Atlanta**, **Southwest Florida**, and

[7] For the purposes of the Atlanta Region analysis, *community banks* are defined as insured commercial institutions with assets of less than $1 billion. Also, this analysis excluded special-purpose entities, new banks, and banks that had been involved in any merger activity.

Map 1



South Florida (see Map 1). Though less concentrated than the key markets, **Central and Northeast Florida**, the **Alabama coast/Florida Panhandle**, and **Northern Virginia** also are home to pockets of fast-growing community banks. During a period of rising rates, greater reliance on more interest-rate-sensitive funding sources, combined with the competitive nature of these markets, may continue to pressure funding costs.

Scott Hughes, Regional Economist
Ronald Sims II, Senior Financial Analyst

Large and Small Banks in the Mid-Atlantic States Differ in Their Funding Strategies

Some of the world's largest FDIC-insured institutions are headquartered in the Mid-Atlantic states. In fact, 18 percent of the FDIC-insured institutions headquartered there have more than $1 billion in assets, while only 6 percent of institutions elsewhere meet that threshold. As a result, large institution funding trends significantly affect both the regional landscape and national trends.

Larger institutions historically have relied more on noncore funding than have smaller institutions. The largest institutions in the Mid-Atlantic, those with assets greater than $10 billion, have noncore funding levels considerably greater than that of institutions with assets less than $1 billion (see Table 1). Over the past three years, the ratios of noncore funding to assets reported by institutions with assets of $1 billion to $10 billion have been more than 10 percentage points higher than those of Mid-Atlantic community banks, while institutions with assets of $10 billion or more reported ratios of noncore funding to assets almost 30 percentage points higher. The biggest difference between the funding profiles of large versus smaller banks is their use of FHLB advances, purchased federal funds, and foreign deposits.[8]

The Mid-Atlantic's larger institutions have reported funding costs slightly less than or roughly equivalent to those of community banks during the past three years, despite significantly higher noncore funding levels.[9] This may suggest that the largest institutions have some competitive advantage over smaller banks in gathering noncore funding. Larger institutions typically have greater access to capital markets and generally may be perceived as a lower-risk premium among investors when borrowing uninsured funds.[10] Of course, many factors can affect a bank's overall cost of funds, such as the maturity composition of liabilities and the perceived credit risk associated with borrowings. Nevertheless, higher levels of noncore funding do not necessarily equate to higher funding costs, particularly among larger institutions.

For community banks, however, the incremental costs of adding noncore funding may be higher than for large banks. Community banks that have a significant reliance on noncore funding (greater than 30 percent of assets) typically have much higher funding costs than other community banks. In the Mid-Atlantic states, community banks below this threshold have a cost of funds of only 1.88 percent, compared with 2.23 percent for those with a larger amount of noncore funds. A similar relationship holds nationwide and has existed for many years.

Looking ahead, should core deposit competition intensify along with rising interest rates, Mid-Atlantic institutions are likely to continue to see noncore funding levels grow, particularly among smaller institutions. Moreover, while core deposit rates typically lag changes in market interest rates, rates on noncore funding are more sensitive to interest rate changes. For smaller institutions, rising rates, coupled with a shift to generally

[8] The larger amount of foreign deposits held by the Mid-Atlantic large banks reflects the presence of multinational operations.
[9] The cost of funds calculations represent the ratio of annualized year-to-date interest expense to average interest-bearing liabilities through September 30.
[10] Risk premiums differ by issuer based on individual credit risk and liquidity premiums.

Table 1

Mid-Atlantic Funding Profile

	Asset Size		
	Less than $1 Billion	$1 Billion to $10 Billion	Greater than $10 Billion
Institutions*	552	108	25
Core deposits to assets	67.0%	53.2%	28.7%
Noninterest-bearing deposits to assets	10.7%	8.1%	8.7%
Noncore funding to assets	22.4%	35.0%	55.3%
Brokered deposits to assets	1.1%	3.0%	4.1%
Large time deposits to assets	11.5%	12.1%	6.2%
Foreign deposits to assets	0.1%	1.9%	24.4%
Borrowings to assets	10.4%	20.5%	22.5%
FHLB Advances to Assets	7.3%	8.7%	2.0%
Banks with brokered deposits	18.5%	38.9%	80.0%
Cost of funds**	1.96%	1.80%	1.94%
Net interest margin**	3.60%	3.18%	3.05%

*Individual insured institutions, not consolidated holding companies. Excludes new and specialty institutions.

** Year-to-date, annualized.

Source: Federal Deposit Insurance Corporation. Data as of September 30, 2004.

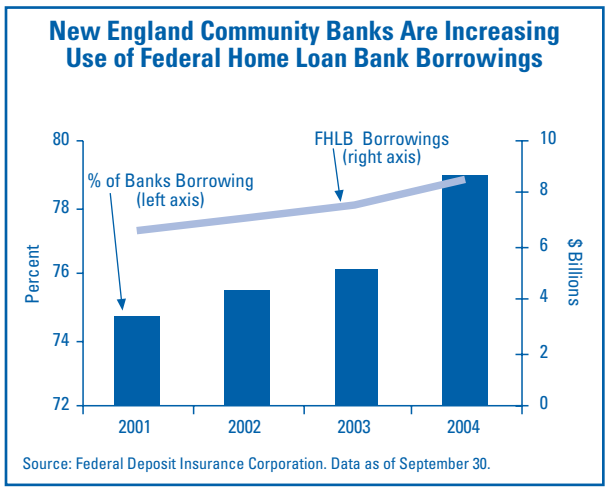
higher-cost noncore funds, will potentially mean a more rapid increase in funding costs than during the past year. In the Mid-Atlantic, higher NIMs reported by smaller institutions as compared with larger banks should help absorb some incremental increases in funding costs.[11] Also, smaller institutions have had slightly higher levels of noninterest-bearing deposits and greater success in growing these deposits; if the trend continues, these noninterest-bearing deposits will help offset the costs associated with growing noncore funding.

Mike Anas, Senior Financial Analyst
Kathy R. Kalser, Regional Manager

New England Institutions Use Noncore Funding to Support Longer-Term Asset Portfolios

The composition of funding among New England community banks has changed markedly since the end of the 2001 recession. The dollar volume of borrowings grew almost 22 percent from third quarter 2001 to third quarter 2004, compared with total deposit growth of only 3.0 percent. Borrowings are largely composed of FHLB advances, which have grown 30.2 percent since third quarter 2001. Community banks in New England, many of which are similar to thrifts by their specialization in mortgage lending, have long participated in the FHLB system. Almost 79 percent of New England community banks have outstanding FHLB advances, the highest percentage of any FDIC region in the country and well above the national average of 60.7 percent (see Chart 3).

Chart 3



[11] For more information on net interest margin performance across bank asset sizes, see "Does Net Interest Margin Matter to Banks?" by Jack Phelps, Scott Hughes, Ronald Sims II, and Robert L. Burns in *FDIC Outlook*, Summer 2004, http://www.fdic.gov/bank/analytical/regional/ro20042q/na/index.html.

Nonmaturity deposits have also increased more than 15 percent in dollar terms during the past three years, offsetting a similar decline in time deposits.[12] Community banks generally have enjoyed an increase in nonmaturity deposits since the stock market decline of 2000, as investors pulled money out of the stock market and placed those funds in secure, liquid bank deposits. In addition, while brokered deposits support only 1.2 percent of total assets, the percentage of New England community banks using brokered deposits has grown substantially, from 5.2 percent in 2000 to 19.3 percent in 2004.

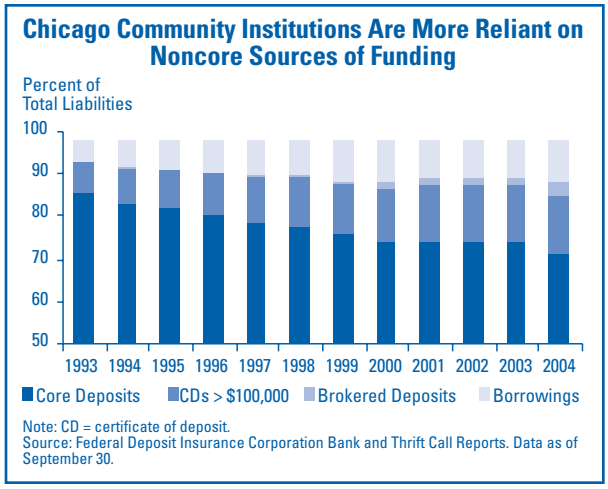
During the past five years, New England's savings institutions have held portfolios with a historically high level of long-term assets, primarily mortgage loans.[13] With the low interest rates and a relatively steep yield curve that persisted through much of 2004, banks have retained a large portion of long-term assets on their books to help augment a narrowing NIM.[14] However, the market value of these long-term assets may decline in value should interest rates rise. In addition, as longer-term interest rates have increased since mid-2004, refinancing activity has declined, thereby scaling back an important stream of income for New England institutions.

Paul M. Driscoll, Regional Manager

Chicago Region Banks Use a Variety of Noncore Products to Address Their Funding Needs

Consistent with the national trend, community banks in the Chicago Region are becoming more reliant on noncore funding sources (see Chart 4). Increasing competition among banks, thrifts, and nonbanks as well as higher-yielding investment alternatives have made it more difficult for many community banks in the Region to attract core deposits.[15]

Chart 4



Trends in noncore funding vary throughout the Region. **Ohio**, for example, is a very competitive banking market with a relatively high number of banking branches dominated by large regional banks. In the past two years, core deposits slowed for Ohio community banks as competition heated up. In response to weak core deposit growth, banks and thrifts in Ohio increased their reliance on noncore funding more than any other state in the Region—their ratio of noncore funding to total assets rose by 315 basis points to 25.8 percent in the year ending September 30, 2004. Ohio institutions also reported the Region's largest 12-month increase in the ratio of FHLB borrowings to assets, which grew by 140 basis points to 8.8 percent as of third quarter 2004.

Although most banks in the Region saw an increase in noncore funding, the type of noncore funding used predominantly by banks in the different states varied. For instance, **Wisconsin** banks and thrifts funded 5.2 percent of their assets with brokered deposits in third quarter 2004, up from 3.7 percent a year earlier. Although the share of large time deposits to assets increased across all community banks in the Region, community banks headquartered in **Michigan** reported the greatest shift, with the percentage of large time deposits to assets increasing by 225 basis points in the past year. And banks and thrifts based in **Indiana** and **Kentucky** are turning more frequently to FHLB borrowings—near the end of 2004, more than 80 percent of FDIC-insured community banks in these two states reported some level of FHLB borrowings, up from approximately 72 percent three years earlier.

Linda Lo, Financial Analyst

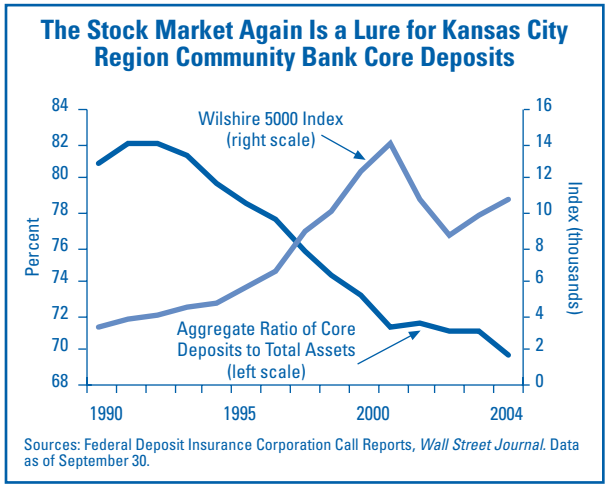
[12] *Nonmaturity deposits* are deposits with no set maturity date, such as demand accounts, savings accounts, NOW accounts, and money market accounts.
[13] *Long-term assets* are defined as assets that mature or reprice after five years; see FDIC Call Report Instructions.
[14] For further discussion on yield curves, see "Rate/Volume Analysis: An Off-Site Approach to Measuring Interest Rate Risk" by Ronald Sims II in this issue.
[15] The increasing competition among banks as well as between banks and nonbank financial companies is discussed in "The Future of Banking in America: Summary and Conclusions" by George Hanc, *FDIC Banking Review* 16, no. 1 (2004), http://www.fdic.gov/bank/analytical/banking/2004nov/index.html.

A Confluence of Factors Contribute to the Decline of Noncore Funding in the Kansas City Region

Before 1990, the Kansas City Region's small community banks consistently funded more than 80 percent of their total assets with core deposits.[16] In the 1990s, however, the convergence of a number of factors has made it harder for these banks to continue to acquire core deposits. These factors include disintermediation caused by rapidly increasing stock markets, competition for deposits from large banks and credit unions, and depopulation in most of the Region's rural areas. As a result, core funding as a percentage of total assets dropped steadily in the 1990s (see Chart 5). By 2000, just over 71 percent of small community bank assets were funded by core deposits.

As core deposit levels declined in relation to total assets, institutions were forced to look to other sources of funds, including large time deposits, FHLB borrowings, and, in some instances, brokered deposits. The use of these funds reached a peak in third quarter 2000 as the Region's small community banks used noncore funds to finance 17.8 percent of total assets, compared with 7.9 percent eight years earlier. And, while large time deposits made up the bulk of small community bank noncore funding, alternative sources such as FHLB borrowings were commonly used as well. FHLB borrowings nearly tripled from just under $3.0 billion in 1992 to $8.6 billion in 2000.

Chart 5



Sources: Federal Deposit Insurance Corporation Call Reports, *Wall Street Journal*. Data as of September 30.

Downward trends in core funding reversed temporarily at the beginning of this decade as declining stock markets led investors to seek the safety of FDIC-insured bank deposits (see Chart 5). From 2000 through 2003, the percentage of total assets funded by core deposits varied little (between 71.1 percent and 71.5 percent), marking the first period of stability in more than ten years. In part due to this stability in core funding, the median small community bank NIM improved by 14 basis points in 2002.

However, recent rebounds in the stock market may once again be luring funds away from the Region's small community banks, and the long-term downward trend in core funding appears to have resumed. As of September 30, 2004, core funds made up only 69.6 percent of bank assets, representing the first time that the ratio has fallen below 70 percent. Noncore funds, led by surges in FHLB borrowings (up by $1.2 billion, or 14.6 percent, during the 12 months ending September 30, 2004) and large time deposits (up $600 million, or 4.2 percent, over the same time period), funded a record 19 percent of total banking assets. As a result, the median NIM among the Region's small community banks as of third quarter 2004 was 4.05 percent, down slightly from 2003 and far below the level of 4.42 percent of a decade ago.

John M. Anderlik, Regional Manager

Rural Institutions in the Midsouth Area Have Significantly Increased Use of Noncore Funding

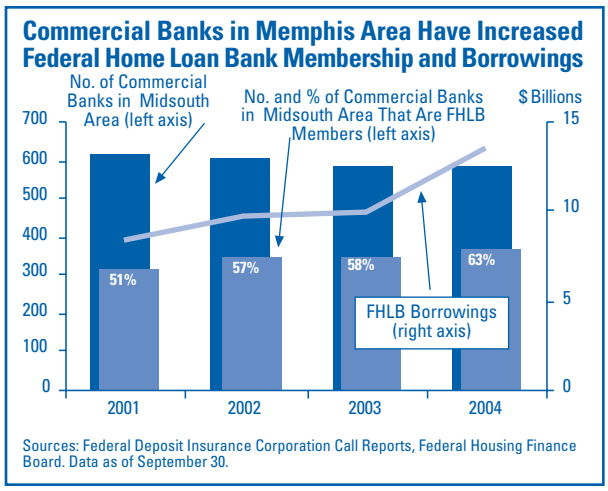
As a result of slow growth in core deposits, the ratio of noncore funding to assets for community banks based in the Midsouth Area reached an all-time high in third quarter 2004.[17] A major contributor to this trend is the rapid increase in the number of commercial banks using FHLB advances (see Chart 6).

The shift from core deposits to generally more costly funding alternatives has been most pronounced among FDIC-insured institutions in rural areas, although there is a wide variance in usage among those areas. The growth in noncore funding sources varies significantly between institutions in rural areas highly dependent on

[16] *Small community banks* in the Kansas City Region are defined as banks and thrifts with fewer than $250 million in total assets. These institutions currently represent 89 percent of the Region's total institutions.

[17] The Midsouth Area includes Arkansas, Louisiana, Mississippi, and Tennessee. The ratio of noncore funding to total assets reached a historic median high of 22.7 percent in third quarter 2004.

Chart 6



manufacturing employment and those in areas less dependent on manufacturing.[18] During the year ending September 2004, the median ratio of noncore funding to total assets increased 90 basis points to 22 percent of assets among rural-based FDIC-insured institutions in areas highly dependent on manufacturing employment. Although rural-based FDIC-insured institutions that are less dependent on manufacturing also have begun to use alternative funding sources, the degree of change has been much less dramatic at 6 basis points during the same period. Employment in rural areas traditionally has been centered in the manufacturing sector, which suffered severe job losses even before the national recession in 2001.

The increasing reliance on noncore funding sources among banks and thrifts based in manufacturing-dependent rural areas likely contributed to the median NIM decline of 7 basis points in third quarter 2004 from one year ago. By contrast, the median NIM among FDIC-insured institutions less dependent on manufacturing was relatively unchanged in the same period. Should the use of noncore funding continue to grow among FDIC-insured institutions based in the Midsouth Area, it is reasonable to expect that pressures on NIMs could increase.

F. Miguel Hasty, Senior Financial Analyst

[18] Areas highly dependent on manufacturing employment are defined as those with 32 percent or more of total employment attributed to the industry (top quartile). Areas less dependent on manufacturing are those with 13 percent or less of total employment (bottom quartile).

Smaller Metropolitan Areas in the Southwest Report Stronger Core Deposit Growth than Larger Metropolitan Areas

Community banks in the Southwest, especially those located in highly competitive banking markets, have increased their use of alternative funding sources.[19] Reflecting the heightened competition for business and consumer deposits, community banks based in the Southwest are reporting a median core deposit ratio of 71.1 percent. Although this rate remains slightly above the national rate, it is the lowest level in two decades for Dallas Region institutions. As the Region's economy continues to improve, historical trends suggest loan demand should increase as well, prodding community banks to consider alternative sources of funding when evaluating new loan and investment opportunities.

Shifting funding strategies also can be observed by considering the kinds of markets where banks and thrifts operate—that is, metropolitan, micropolitan, or rural.[20] In contrast to the rest of the Region, FDIC-insured institutions in Southwest micropolitan counties have reported higher ratios of core deposits to assets during recent years (see Chart 7). The increase could be due, at least in part, to the significant growth in per capita income in these micropolitan areas, which was almost 18 percent during the four years ending December 31, 2003. This rate exceeds the 12 percent growth rate recorded in the Southwest's metropolitan areas. Similarly, employment growth in micropolitan counties increased 6.1 percent over the same four-year period, significantly above 1.9 percent reported in metropolitan counties. This comparatively strong job growth in the Region's micropolitan areas appears to be a positive factor for bank deposit growth. In addition, stronger job growth may allow banks headquartered in these micropolitan counties to be better positioned to attract core deposit funding. Alternatively, FDIC-insured institutions based in metropolitan counties may need to use alternative funding sources if the downward trend of the ratio of core deposits to assets continues.

Jeffrey A. Ayres, Senior Financial Analyst

[19] The Southwest includes Colorado, New Mexico, Oklahoma, and Texas.

[20] According to the U.S. Census, a metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants, a micropolitan statistical area must have at least one urban cluster of at least 10,000 but less than 50,000 in population, and a rural area does not contain an urban cluster of at least 10,000.

Chart 7

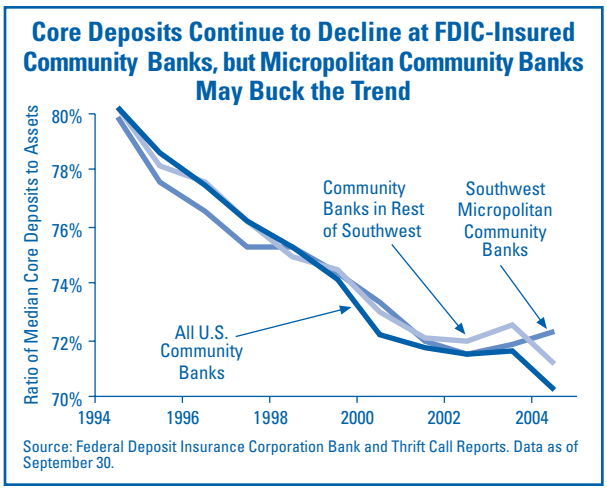
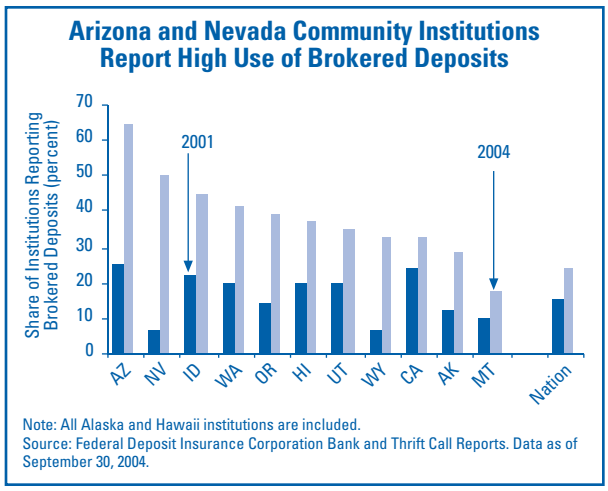


Chart 8



Brokered Deposits Are Becoming a More Important Source of Funds in a Number of Western States

Community banks based in the West have experienced strong loan demand during the current economic expansion, particularly in construction loan portfolios. In turn, this loan demand has contributed to an increased need for funding. Although core deposits continue to comprise the bulk of funding, FDIC-insured institutions based in the San Francisco Region are reporting an increased reliance on noncore funding sources, consistent with national trends.

Brokered deposits have been an important component of the increase in noncore funding in the Region since 2001. As of September 30, 2004, 37 percent of all FDIC-insured financial institutions in the Region reported the use of brokered deposits, up from less than 25 percent three years ago. The use of brokered deposits was higher among institutions that have been in operation for less than nine years; 43 percent of these institutions reported brokered deposits. The percentage of FDIC-insured institutions reporting brokered deposits was particularly high among community banks based in **Arizona, Nevada,** and **Idaho,** where construction loan demand was propelled by strong housing construction activity, robust in-migration, and strong employment growth (see Chart 8). These markets also have had significant new bank chartering activity during the past nine years.

As of September 30, 2004, banks and thrifts headquartered in Arizona, Nevada, and Idaho ranked in the top five states nationwide for FDIC-insured institutions with construction and development loan exposure, employment growth, and population growth, and in

Table 2

Strong Economic Growth Drives Use of Brokered Deposits

	Arizona		Nevada		Idaho	
MEASURE	**Percent**	**Rank**	**Percent**	**Rank**	**Percent**	**Rank**
Institutions reporting brokered deposits	64.5	1	50.0	3	44.4	7
Construction loan concentration	150.5	1	137.5	2	92.2	5
GROWTH RATES (year-over-year)						
Deposits	20.7	3	22.7	1	20.9	2
Population	3.0	2	4.1	1	1.9	4
Employment	2.4	5	4.5	1	2.6	4

Note: Rankings are among the 50 states and the District of Columbia. The construction loan concentration is the median percent of Tier 1 capital.

Sources: U.S. Census Bureau, Bureau of Labor Statistics, and Federal Deposit Insurance Corporation Bank and Thrift Call Reports. All data are as of September 30, 2004, except the population growth rate ranks, which are as of July 1, 2004.

the top ten for brokered deposit usage (see Table 2). Of banks reporting brokered deposits, community banks in Arizona reported more than twice the 3.9 percent national median level of brokered deposits to assets. In Nevada and Idaho, however, the median concentration of brokered deposits was similar to that of community banks across the nation.

Robert E. Basinger, Senior Financial Analyst

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