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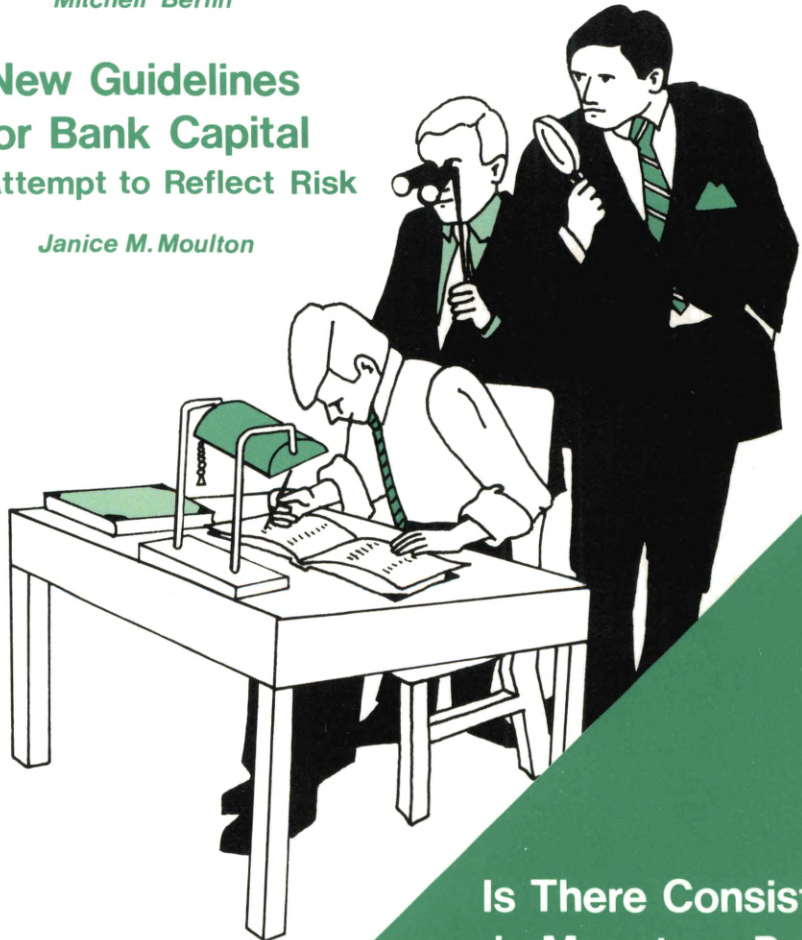
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Will firms increasingly turn to marketable securities instead of bank loans as a source of funds for business? Recent economic theory sheds some light on this question by analyzing the essential differences between bank loans and marketed securities. In particular, the research explores the types of financial contracts among firm insiders, firm outsiders, and banks as delegated monitors.

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Bank regulators have proposed new capital guidelines that are designed to account for both the different risks of balance sheet assets and the riskiness of a number of off-balance sheet assets that have become a more prominent feature of banking. This paper looks at how the guidelines would be applied, how they would affect capital requirements for area banks, and some controversial issues that remain to be resolved.

Is There Consistency in Monetary Policy?*

*Edward G. Boehne, President
Federal Reserve Bank of Philadelphia*

One sometimes gets the impression from the press and elsewhere that both the goals and the conduct of monetary policy vary erratically, and that there is no consistency from year to year in monetary policy. Now the Federal Reserve is said to care about exchange rates. Earlier it was said to have focused on interest rates. Before that it was said to have focused on economic growth, or inflation, or unemployment, or the money supply.

As economists, we can apply some straight-forward economic theory to see that monetary policy decisions over the past several years *do* fit into a consistent analytic framework. And we can ask about the implications of that analytic framework for the conduct of monetary policy during 1987 and future years. Before applying the theory we need to agree on the *goals* of monetary policy, however.

THE TWO MAJOR GOALS OF MONETARY POLICY

In my view there are two major goals of monetary policy. The first goal is achieving continued, sustainable growth to return the

*An address to the annual conference of the Pennsylvania Economic Association, Bloomsburg University, Bloomsburg, Pennsylvania, May 29, 1987.

economy to full employment and then to keep the economy at, or near, full employment. The second goal is reducing the inflation rate—at least from one business cycle to the next, if not from year to year—until price stability is achieved. It is easy for economists and policymakers to agree on these goals; it is harder to agree on specific policies to achieve them, or to agree on exactly what we mean by “full employment” or “price stability.” Nonetheless, we need to keep these goals in mind as we discuss the theory of monetary policy.

THE THEORY OF MONETARY POLICY

Despite all of the arguing about the details of monetary policy, economic theory tells us that basically there are just two ways to conduct monetary policy. The first way is for policymakers to use the *money supply* as an instrument or as an intermediate target. To do so, policymakers would set the level and growth rate of the money supply at values they believe consistent with the desired level of output and desired rate of inflation, and let interest rates be determined solely by market factors. The alternative is for policymakers to use an *interest rate* as their instrument or intermediate target. Policymakers would do so by setting a nominal interest rate at a level that they believe will produce a real rate that is consistent with the desired level of output and desired rate of inflation, and let the money supply be determined by market forces.¹

Although it is an oversimplification, we can usefully think of policymakers *as if* they target a sequence of short-run goals that converge to long-run goals, and then set the value of their

chosen instrument each period so as to hit the sequence of short-run objectives. Regardless of which instrument is chosen, the appropriate value of the instrument (the value that will hit the desired short-run goal) will change if there are changes in other factors, or if there are changes in behavioral relationships.

Theory tells us that the two ways to conduct monetary policy will work equally well if there are no unanticipated shocks to either goods markets or financial markets, and if behavioral relationships are stable. If there are unanticipated shocks, however, theory tells us that the two ways to conduct monetary policy will not produce the same results.

Theory also offers some guidance about how to choose the instrument or intermediate target. When goods markets are subject to demand shocks, but financial markets are not, then the monetary authority can minimize fluctuations in output and prices around their target values by using the money supply as its instrument or intermediate target.² But when financial markets are subject to shocks and goods markets are not, then the monetary authority should use an interest rate as its instrument or intermediate target.³ (I should note that the theory indicates that policymakers should use a *real* interest rate as their instrument in this situation, but in practice policymakers are limited to setting a *nominal* interest rate at a level that they hope will produce the desired real rate.) If we are in the unfortunate position of having shocks to both financial and goods markets, theory suggests that the monetary authority should focus on the primary source

¹I should note that policymakers could also use the *exchange rate* as an instrument or intermediate target. To do so, they would have to let the money supply and interest rates adjust to whatever values are necessary to keep the exchange rate equal to its target value. In practice this would mean giving up the possibility of an independent monetary policy, and letting our monetary policy be determined by foreign central banks. That may be a good idea for some small economies, but it is not a good idea for the United States.

²In economists' terminology, when the IS curve is subject to shocks but the LM curve is not, then using the money supply rather than an interest rate as the instrument of monetary policy will result in smaller fluctuations in output and the price level around their target values.

³In technical terms, when the LM curve is subject to shocks but the IS curve is not, then using an interest rate as the instrument of monetary policy can stabilize output and the price level at their target values, while using the money supply as the monetary instrument will produce fluctuations in output and the price level.

of shocks, unless the shocks to financial and goods markets routinely happen to cancel. These results were elegantly derived by William Poole, who was then an economist in the Federal Reserve System. I will refer to these results as *Poole's Rule*.

While there are some important issues in monetary policy that are not addressed by this theoretical framework, it can nonetheless give us a good deal of insight into the recent conduct of monetary policy, and into the conduct of monetary policy during 1987 and future years. We will see that there is an underlying consistency in monetary policy in recent years.

POOLE'S RULE AND RECENT MONETARY POLICY

Many people have characterized monetary policy as being "accommodative" during the past several years, by which they mean that interest rates have fallen. I think that it is correct to characterize monetary policy during 1985 and 1986 as "accommodative," if we use that word in the economist's technical sense of accommodating shifts in the demand for money.

The last few years were a period in which the demand for money grew much more rapidly than was predictable on the basis of its historical relationship to income, interest rates, and other variables. The unusual behavior of money demand has lasted so long that one must admit that there was a shift in the demand for money, rather than just a temporary deviation from a stable demand for money function. That conclusion is inescapable for M1, which grew roughly twice as fast during 1985 and 1986 as we would have expected on the basis of its pre-1980 behavior. The conclusion also seems true for M2 and M3, although their deviations from expected growth are not so drastic. As best we can tell within the Federal Reserve, the shift in money demand reflects a change in people's preferences about how much of various assets to hold in their portfolios. The shift in portfolio preferences has resulted, in turn, from deregulation of finan-

cial intermediaries and the resulting proliferation of new financial instruments, such as super-NOW accounts.

Poole's Rule tells us that the monetary authority should choose an interest rate as its instrument if the major source of uncertainty about the economy arises in financial markets, in this case because of unpredictable behavior of money demand. That is essentially what the Federal Reserve did. Henry Wallich, then a Governor of the Federal Reserve System, described the details of that monetary policy in a speech to the Midwest Economic Association; his speech was reprinted in a 1984 article in the Kansas City Federal Reserve Bank's *Economic Review*. While the Federal Reserve does not directly control interest rates, except for the discount rate, the Federal Reserve did adjust the supply of bank reserves and the discount rate to keep the federal funds rate roughly at a level that was consistent with achieving the major goals of monetary policy. And the Federal Reserve allowed the federal funds rate to adjust in response to evidence that the economy was beginning to deviate from a path that converged to long-run full employment and price stability.

Of course the FOMC did adopt targets for growth of the money supply in 1985 and 1986.⁴ But the members of the FOMC recognized that the targets were based on the assumption that the demand for money would have the same relationship to economic variables as in the past. When that assumption proved false, money growth was allowed to deviate from the targets, in accordance with Poole's Rule. It is in this sense that monetary policy was "accommodative" during recent years; the Federal Reserve accommodated a shift in the demand for money.

⁴The Federal Open Market Committee, or FOMC, is responsible for making monetary policy decisions in the United States. The FOMC is composed of the Governors of the Federal Reserve System and, on a rotating basis, five of the Presidents of the twelve regional Federal Reserve Banks.

We know that there were surprises in goods markets as well as in financial markets over the past couple of years, although goods markets generally turned out closer to what economic forecasters had predicted. Two shocks to goods markets stand out. The U.S. trade deficit was substantially larger than had been predicted, in both 1985 and 1986, as prices of imported goods responded with a longer than expected lag to changes in the exchange rate. And tax reform generated much weaker investment spending in 1986 than had been predicted, because the forecasters had not anticipated that tax reform would actually be enacted. These shocks to goods markets generated slower than expected growth in output, and seemed likely to end progress toward full employment, at least temporarily. In response to these shocks to goods markets, the Federal Reserve lowered the discount rate, and thus the federal funds rate, to levels that seemed consistent with continued progress toward the long-run goals of monetary policy.

It is also the case that we had a good-sized "supply shock" during this period—the big drop in the price of oil during 1986. The Poole's Rule framework does not tell us how to respond to a supply shock; such a shock affects both the markets for goods and for financial instruments. We can easily convince ourselves that a one-time change in the price of oil does not change the need to use an interest rate as the instrument of monetary policy, *so long as there remains substantial uncertainty about the demand for money*. The oil price shock may well change the appropriate level of the instrument, however, if the shock pushes the economy away from the path that converges toward policymakers' long-term goals. On balance the oil price drop slowed the U.S. economy in 1986, as the negative effects on energy-producing regions outweighed the positive effects on energy consumers. Thus the oil price shock helped to generate a reduction in interest rates during 1986.

Looking back over the past few years, we can conclude that Poole's Rule serves us reasonably

well as an aid to understanding monetary policy. Monetary policy basically used an interest rate instrument during a period of unpredictable behavior of the demand for money. The outcome was that the economy continued to expand, the unemployment rate gradually fell, and the rate of inflation declined somewhat further—even abstracting from the temporary effects of lower oil prices. We could have achieved even better results had we been able to coordinate monetary and fiscal policies more effectively, but that is something that the Federal Reserve System cannot do by itself.

THE CHALLENGE FOR MONETARY POLICY IN 1987 AND FUTURE YEARS

We know that measured inflation in 1987 will be higher than in 1986, because oil prices reversed their precipitous decline, and because the depreciation of the dollar on foreign exchange markets is generating large increases in import prices this year. Much of the measured deceleration in inflation during 1986 was a temporary phenomenon due to falling oil prices. And much of the jump in the Consumer Price Index and Producer Price Indexes early in 1987 reflects the turnaround in oil prices and higher prices of imports, rather than an acceleration of price increases for U.S.-made goods. Because oil prices are no longer rising appreciably, the jump in measured inflation during the first few months of 1987 is also likely to be temporary.

The challenge facing monetary policy now is to ensure that *temporarily* higher inflation in 1987 is *not* allowed to become *permanently* higher inflation during the following years. Fortunately, higher oil prices and higher import prices are not generating big wage increases, or widespread price increases for domestically produced goods, so far. Thus it should be possible to prevent a sustained increase in inflation without causing a sharp slowing in the economy.

What does the theoretical framework provided by Poole's Rule tell us about how to run monetary policy in 1987 and later years? Poole's Rule first leads us to ask about the sources of uncertainty

in the economic outlook. In contrast to the past few years, now it seems that the major source of uncertainty about the economic outlook comes from uncertainty about demands for goods and services. While most forecasters now expect real GNP growth of 2.5 to 3.5 percent during 1987, and roughly the same growth in 1988, there is much disagreement and uncertainty about the sources of that growth. There is uncertainty about fiscal policy because it is difficult to say with any precision just what the Congress and the Administration will do about the Gramm-Rudman-Hollings deficit reduction targets. That uncertainty is particularly acute for 1988. There is uncertainty about the effects of tax reform on consumption and investment spending; no one yet understands the full implications of the new tax law. And there is uncertainty about the future value of the dollar and how much the trade balance will improve.

Poole's Rule advises that a situation in which the major uncertainty is about goods markets (and thus about the location of the IS curve) is one in which the monetary authority should use the money supply rather than an interest rate as the instrument of monetary policy. Which measure of the money supply should the Federal Reserve use as its monetary policy instrument?

On the basis of economic relationships up to 1980, one would argue that the Fed should use M1 because M1 growth was closely linked to economic growth and, with a lag, to inflation. But on the basis of M1's behavior during the past five years, and during 1985 and 1986 in particular, one would be hard-pressed to justify using M1 as the monetary instrument. In contrast to its historical trend of 3 percent growth, M1 velocity fell at an average rate of nearly 9 percent during 1985 and 1986. And it is still falling during the early part of 1987. Even taking into account the declining opportunity cost of holding checkable deposits during 1985 and 1986, M1 velocity fell about four times as much as predicted. Until we get evidence that the demand for M1 has stabilized, policymakers will be reluctant to put much weight on M1 (because, in economists' jargon,

controlling M1 is unlikely to result in a stable LM curve). But the Federal Reserve will continue to monitor M1 to see if its behavior does stabilize.

Because of the uncertainty about M1's behavior, policymakers are forced to rely on M2 and M3, instead. Prior to 1980, M2 and M3 growth had a looser relationship to output growth and inflation than did M1. But during the 1980s the relationship has been much more stable for M2 and M3 than for M1. Still, the relationship between M2 or M3 and future real GNP and inflation is much too loose simply to set a value of the M2 or M3 instrument that is believed consistent with the long-run goals of monetary policy, and then wait for the desired outcomes. Instead, it will be necessary to continue monitoring other economic variables for evidence on whether the economy is behaving as expected. Some people criticize this as "looking at everything," but it is a sensible thing to do in the current economic environment. By continuing to monitor a variety of economic variables, the Federal Reserve will be able to recognize a situation in which it becomes necessary to adjust the settings of the M2 and M3 instruments in order to prevent a sustained increase in the inflation rate.

By implementing a monetary policy that is consistent with low and declining inflation over the long run, the Federal Reserve will try to ensure that the temporary rise in inflation that we are seeing during 1987 does not generate expectations of permanently higher inflation. Following such a policy will help to ensure that temporarily higher inflation in 1987 is not built into large wage increases, or into large price increases for domestically produced goods. If we succeed in that task, it should be possible for the U.S. to continue making progress toward both of our long-term goals—price stability and full employment. Of course, to convince people that the Federal Reserve actually will follow a long-run anti-inflationary policy, it may well be necessary to adopt somewhat tighter monetary policy in response to short-run inflationary pressures. As Chairman Volcker indicated in

Congressional testimony at the end of April, the FOMC already has taken a step in that direction.

Let me close this discussion of Poole's Rule and how it helps us to understand current monetary policy by cautioning you that the Federal Reserve does not have direct control over M2 and M3. So M2 and M3 are unlikely to grow as smoothly as one might like. Because the Fed can affect M2 and M3 only indirectly, it would be a mistake to interpret month-to-month variations in M2 or M3 growth as indications of changes in monetary policy. But Poole's Rule does indicate that in contrast to 1985 and 1986, this year is a good year for policymakers to pay more attention to the average growth rate of the money supply—along with other data that would reveal the presence of shocks to goods or financial markets—and to focus less on the level of interest rates as an intermediate target.

THE UNDERLYING CONSISTENCY IN MONETARY POLICY

Let me conclude by recalling the two major goals of monetary policy. First, a continued, sustainable return to full employment. Second, continued progress toward lower inflation and eventual price stability. For 1987 in particular, the challenge is to ensure that *temporarily* higher inflation caused by higher oil prices and rising import prices is *not* allowed to become *permanently* higher inflation.

Economic theory tells us that the proper way to implement monetary policy in order to achieve these goals may change from time to time, as it has during the 1980s, depending upon the source of shocks to the economy. So while some critics may give the impression that the goals and conduct of monetary policy vary erratically, as economists we should understand that there is in fact an underlying consistency.

Bank Loans and Marketable Securities: How Do Financial Contracts Control Borrowing Firms?

*Mitchell Berlin**

INTRODUCTION

Even a close observer of today's financial markets may be bewildered by the ever-changing array of new financial contracts and the shifting fortunes of traditional intermediaries. But behind all this change, the same basic problem is being solved over and over again by savers, borrowers,

and the financial specialists who serve them. Market participants are seeking the most efficient way to transfer the savings of households to firms who need funds. This happens whenever a saver decides whether to deposit her funds in a bank or to call her broker to purchase securities for her portfolio. The same is true when a firm chooses whether to take out a bank loan or to sell securities to the public.

These particular choices—the saver's choice between deposits and securities and the firm's choice between bank loans and securities—have

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been a hot topic in the business press in recent months. The reason is that some firms that used to rely primarily on commercial loans have begun to sell securities directly to the public. The growth of the markets for commercial paper, medium-term notes, and low-grade bonds has raised questions about the preeminent role of commercial banks as intermediaries between savers and businesses.¹ This has excited the interest of crystal ball gazers seeking to decipher long-term trends and economic theorists seeking to explain the roles of bank lending and the direct sale of securities in financial markets.

Banking theorists have been hard at work on this problem in recent years. The kinds of questions that these economists ask are: What functions do intermediaries perform that individual security holders can't perform themselves? Why do some firms seek bank loans while others sell bonds to the public? Why do many firms secure finance through a mixture of bank loans and marketed securities? How do these different types of financial contracts control the behavior of firms?

One basic theme of recent research is that the answers to these questions begin with a simple observation: it is too costly for investors who are not intimately involved in the day-to-day running of the firm, firm *outsiders*, to stay informed about developments inside the firm. In turn, they are unable to influence the firm to prevent mismanagement. Banks arise to fill this gap; they play the part of *delegated monitors* to keep a check on the behavior of firm *insiders*, the managers who run the firm on a day-to-day basis.

¹For popular accounts of the changing role of banks in financial markets see, for example, "The World is Their Oyster," *The Economist* (March 16, 1985) p. 20, and "The Consumer is Sovereign," *The Economist* (March 22, 1986) p. 20. For a description and analysis of the low-grade bond market, see J.G. Loeyes, "Low-Grade Bonds: A Growing Source of Corporate Funding," this *Business Review* (November-December 1986) pp. 3-12, and the references therein.

BANKS AND OTHER FINANCIAL INTERMEDIARIES

Depository Intermediaries Reduce Transactions Costs. Depository intermediaries like savings and loans, mutual funds, and banks link ultimate borrowers, especially firms, and ultimate savers, the households of the economy. While borrowers and savers might seek each other out and strike deals without going through intermediaries, traditional banking theory says that this will be a groping and inefficient process.

To see the difficulties, consider what a typical saver would have to do to invest her money in some firm without using an intermediary. First, she would have to locate a firm that needs money and determine whether this firm is creditworthy. Then, she and the firm would have to bargain over how much money she will invest, for how long, and at what rate of return. She would probably prefer to buy securities with small denominations that pay off quickly so that her money isn't all tied up. The firm, on the other hand, would most likely rather sell just a few large securities, and it may need money for a project that will not pay off until sometime far in the future. Suppose the firm and the saver overcome all of these problems and actually strike a deal. Then she still has to keep a close watch on the firm until she is paid back.

This account, of course, is very unrealistic. But it does illustrate the notion of *transactions costs*, that is, the time, trouble, and expense of transacting business.² More likely than not, these costs are so large that the deal will never be made. The firm will simply make a best guess about the types of securities that can be sold. And the saver will either buy securities that don't meet her needs or refuse to buy securities at all. Thus, transactions costs are a barrier

²See George Benston and Clifford W. Smith, "The Transactions Cost Approach to the Theory of Financial Intermediation," *Journal of Finance* (May 1976) pp. 215-232, for a discussion of banks as institutions that minimize transactions costs.

between savers and firms.

One way to bridge this barrier is with an intermediary, such as a bank. Our saver can put her money in the bank, which then invests the funds in a portfolio of borrowers' IOUs. In effect, intermediaries perform a number of functions that match borrowers and savers. They buy large securities, while offering savers small accounts—a function called “size transformation.” They hold securities that are hard to sell, while offering savers immediate access to their savings—known as “liquidity transformation.” By holding a large portfolio of the securities of many firms, they allow even small savers to diversify. Finally, they *monitor* the firms in their portfolio. Monitoring includes not only keeping track of each firm's financial condition, but also supervising firms and enforcing loan contracts.

But Not All Intermediaries Act Like Banks. Like banks, other intermediaries such as mutual funds and money market mutual funds overcome many transactions costs. They assemble diversified portfolios of securities and sell different size shares that are readily transformed into cash. But, unlike banks, mutual funds perform only part of the monitoring function. While they collect and interpret information about the firms in their portfolio, they do not supervise firm managers or negotiate and enforce loan contracts. Thus, a single transactions cost, the cost of monitoring firms, is key to understanding the difference between bank lending and other types of intermediation.³

In fact, recent economic theories of financial intermediation consider the cost of monitoring to be the key to understanding the difference between bank loans and all marketable securities, whether held by intermediaries like mutual funds or by individuals. Recent economic theory views bank loans and marketable securities as

³Many of the statements made about banks in this article are also true of insurance companies, which monitor private placements—nonmarketable bonds usually held by a small number of investors. Insurance companies have longer term assets and liabilities than do banks.

alternative methods of controlling the behavior of borrowing firms, each with its own advantages and disadvantages (see A SELECTED BIBLIOGRAPHY, p. 18). By making a full account of these advantages and disadvantages, the theory of financial intermediation attempts to explain the role of both banks and securities in financial markets.⁴

THE TROUBLES WITH SECURITIES MARKETS

Insiders, Outsiders, and “Agency Problems.” “Agency problems” don't just arise in securities markets, they crop up any time people expect somebody else to do something for them. When someone hires a lawyer to represent him in court or pays a mechanic to fix his carburetor, the lawyer and the mechanic are both *agents*. They are supposed to act on someone else's behalf. Problems may arise, though, because the agents have their own interests to think about. The lawyer may do a shoddy job because he wants to concentrate on a more important case. And the mechanic's bill may include a charge for repairs to a fuel pump that was working perfectly when the car was brought in. In other words, agents may well pursue their own interests whenever they can get away with it, even at the expense of their delegated responsibilities.⁵

In securities markets, firms are agents of the bondholders who lend them money. Bond-

⁴This article emphasizes the asset services provided by banks. A second strand of the recent literature views banks as providers of liquidity insurance—that is, the ability to obtain funds quickly—to risk-averse savers. See Charles J. Jacklin, “Banks and Risk Sharing: Instabilities and Coordination,” Working Paper No. 185, Center for Research in Security Prices, University of Chicago (June 1986), for a review of this literature. In addition, deposits are insured up to \$100,000 by federal deposit insurance agencies, another attractive feature for risk-averse savers.

⁵Michael Jensen and William Meckling, “Theory of the Firm: Managerial Behavior, Agency Costs, and Capital Structure,” *Journal of Financial Economics*, (1976) pp. 305-360, is the seminal article on agency costs in a finance setting. See Oliver Hart and Bengt Holmstrom, “The Theory of Contracts,” in Truman Bewley (ed.) *Advances in Economic Theory*, Cambridge, Cambridge University Press (forthcoming), for a review of the principal-agent literature.

holders expect the firm to make prudent decisions so that the loan can be repaid. Likewise, firm managers are agents of the stockholders who own the firm. Stockholders expect the managers to run the firm as profitably as possible. If bondholders and stockholders have up-to-date and detailed information about what's going on inside the firm, they should have a fairly easy time controlling the behavior of their agents. But more often than not, firm outsiders know much less about how the firm is managed and how its projects are going than do managers inside the firm.⁶

Insiders have more information than bondholders about the firm's current revenues and about the future of long-term investments. Therefore, they can better assess whether the bondholders will be repaid in full or not. Managers are also in a much better position than stockholders and bondholders to know if the firm is being run efficiently, that is, if costs are being kept down to a minimum and if people in the organization are exerting all their effort. In addition, many complex and uncontrollable factors affect firm performance besides management decisions. When a firm performs badly, outsiders often can't tell what is at fault: bad management or bad luck.

Without firsthand information, lenders and stockholders cannot be sure that their agents will faithfully discharge their responsibilities. The firm's managers have strong reasons to report results that serve their own purposes instead. They may understate the revenues of the firm to reduce payments to stockholders. They may exaggerate the probable returns to troubled projects to avoid having these projects liquidated or to avoid the blame for mistakes. And since efficiency requires considerable effort, self-interested managers may choose to take it

easy rather than work their hardest, or to indulge themselves with perks. Expensive vacations masquerading as business trips and three-martini "business" lunches that last all afternoon are well-known examples.

Of course, investors do have several second-hand sources of information, such as rating agencies, trade newspapers, and investment analysts. But each investor will ask himself if the gains are worth the time and money required to collect information. For investors who do not have substantial amounts of money invested in any one firm, the answer will be "no." Even if an investor does take the trouble to become informed, he must decide whether or not to use his knowledge to take an active role in supervising the firm. Unless the investor has a very large stake in a firm, he is likely to make a hasty decision to buy or sell the firm's securities, rather than take on the full-time job of attempting to control the behavior of firm insiders. The same is true of intermediaries like mutual funds, which assemble a diversified portfolio by investing relatively small amounts in particular firms. In general, the holders of marketable securities have little incentive to monitor firms to keep a check on agency problems.

In fact, even though each investor may be acting rationally when he chooses not to monitor, too little monitoring will often result. This is possible because monitoring is an example of what economists call a *public good*.⁷ When an investor supervises the firm, all other investors benefit whether they monitor or not. But each investor will ignore the benefits he provides for others when he decides whether monitoring is worth the time and trouble. Thus, every investor may decide that his personal gains from monitoring are too small, even when the total gains to all investors are quite large. Everyone would be better off if someone chose to monitor, yet no one may be willing to do so. In this sense, too

⁶This paper emphasizes the agency problem between outsiders and insiders, but there is an extensive literature on the conflicts of interest between stockholders and bondholders. See Smith and Warner (cited in A Selected Bibliography) for an account of this conflict of interest.

⁷See Stiglitz (cited in A Selected Bibliography) for a more complete discussion.

little monitoring occurs in securities markets.

Contracts Inside and Outside the Firm Are Alternatives to Monitoring. Since securities markets are plagued by agency problems and inadequate incentives to monitor firms, why is anyone willing to purchase any firm's securities? Part of the answer is that the use of managerial compensation schemes and the incentive features of bond contracts can reduce (but not eliminate) agency problems.

Stockholders, through their board of directors, design reward schemes that tie top managers' compensation to the performance of the firm. A typical example is an incentive payment linked to measures of success like divisional sales or profits. Also, managers are given options to purchase stock, so that they have a direct stake in increasing the value of the firm.⁸ But the interests of managers and stockholders can't be aligned perfectly, because managers receive only a share of the firm's revenues, while they exert most of the effort needed to produce these revenues. As long as they receive only a portion of the proceeds, managers will still expend too little effort.

Many common features of bond contracts are designed to reduce firm insiders' ability to misrepresent the firm's current and prospective performance. Unlike shares of stock, bonds require the firm to pay a fixed return to investors, usually broken up into a number of coupon payments. These payments are usually made to a trustee, who services the contract on behalf of bondholders. And if a firm misses a payment, bondholders can place the firm in default. In addition, bonds contain covenants that require the firm to satisfy a number of conditions or face default. Some covenants require the firm to meet minimum values for certain financial ratios—

such as the ratio of working capital to total assets or the equity-debt ratio—to prove that its financial condition is healthy. If the firm cannot meet these ratios, it is often an early signal that the firm may not be able to make payments to bondholders.⁹

The threat of default ensures that firm management will make every effort to repay bondholders whenever possible, which reduces bondholders' need to monitor the firm's revenues. And covenant restrictions give bondholders the legal right to intervene to protect their investment when the firm appears to be in trouble. More often than not, firms will take steps quickly to remedy any breach of covenant restrictions. In more extreme cases, however, the firm may undergo reorganization. And in the worst cases, the firm's assets may be liquidated and distributed to its bondholders.

But Bond Contracts Tend to Be Inflexible. While bond contracts protect investors against losses when a firm is in trouble, the price of that protection is inflexibility. A firm with a healthy future may not be able to make payments because of temporary factors beyond the control of management; for example, a recession may cause a decline in demand for the firm's products that will soon abate. Or a firm might breach a covenant because of an unforeseeable change in business conditions. For instance, a firm might fall below its working capital floor because of an unexpected increase in production costs. Yet, the firm may well be capable of reducing its costs given sufficient time.

In these cases, both managers and investors would benefit if managers could request some breathing space to recover and respond. But when no investor is willing to monitor the firm, the firm's managers cannot easily convince investors that a reprieve is not being used merely to delay the day of reckoning. Thus, opportunities for a timely renegotiation of the contract

⁸Anthony Saunders, "Securities Activities of Commercial Banks: The Problems of Conflicts of Interest," this *Business Review* (July-August 1985) pp. 17-26, describes the incentive effects of managerial compensation schemes and the discipline imposed upon management by the marketplace.

⁹See Smith and Warner (cited in A Selected Bibliography).

will often be lost. Instead, with the threat of default in mind, managers will attempt to fulfill the terms of the contract, even when this means cutting back on projects that are fundamentally profitable.

In the worst possible scenario, managers may be unable to comply with the terms of the contract, and a viable firm with severe, but temporary, problems may go bankrupt. Not only can this result in lost future earnings, but the firm's managers and investors are forced to spend precious time and money in expensive bankruptcy and reorganization proceedings. Although investors may need the threat of bankruptcy to motivate the management to run the firm efficiently, spending the time and money to act on this threat benefits neither the firm nor its investors. Everyone (except the lawyers) would do better to reduce the likelihood of unnecessary bankruptcies.¹⁰

The inflexibility of bond contracts is not such a problem for large firms with long histories in established markets. It is relatively easy to design covenants that will not prove overly burdensome when sales revenues are stable and when the firm's usual balance sheet ratios are well-known. On the other hand, firms in new markets or markets undergoing significant changes are likely to have unstable income and expenses. Such firms will view inflexible bond contracts as a straitjacket and will seek a more flexible alternative.¹¹

BANKS ACT AS DELEGATED MONITORS

Bank Loans Are a More Flexible Substitute for Securities. Firms can borrow funds from households yet avoid many of the problems of direct borrowing by taking out a bank loan. By

¹⁰See Brian C. Gendreau and Scott S. Prince, "The Private Costs of Bank Failure: Some Historical Evidence," this *Business Review* (March-April 1986) pp. 3-16.

¹¹See Berlin and Loeys (cited in A Selected Bibliography). In addition, some firms may be too small to bear the underwriting fees and other costs of marketing their own securities directly. These firms really have no alternative to bank loans.

borrowing from a bank, the firm replaces many small lenders with a single lender. Since the bank makes large investments in firms, it will be more willing to monitor and renegotiate contracts than would a group of individual investors.

When a firm cannot make interest payments on time or when its balance sheet indicates trouble, a banker's first response is to take a closer look at the firm's condition. If he finds that the firm's longer term prospects are good, the banker may offer to reschedule interest payments or waive temporarily some covenant. To make sure that good money is not being thrown after bad, however, the banker must stand ready to respond quickly to further declines in the firm's health. It is the bank's willingness to monitor that allows it to be flexible without taking on excessive risks.

By monitoring, the banker is also better able to determine whether the firm's managers are acting efficiently. While it is clearly impossible (and undesirable) for the banker to become involved routinely in detailed management decisions, the bank's watchful eye can reduce the occurrence of serious managerial abuses. In this sense, one can think of the bank as setting a minimum standard of managerial effort.

But Bank Loans Don't Replace All Securities. Although bank loans offer some real advantages over marketable securities, there are good reasons why we see a mix of bank loans and securities in financial markets. The first is that a little monitoring may go a long way, because monitoring is a public good. While it is true that a bank must have a substantial stake in a firm—or else it will act much like other small security holders—it doesn't follow that the bank needs to hold all of the firm's debt. As long as the bank is closely monitoring the firm, the firm's other investors also benefit, even if they remain passive.

Since bank supervision ensures that managers exert at least some minimum amount of effort, the firm's other investors know that the average level of effort is higher than it would be without

monitoring. Indeed, bank supervision also benefits the firm, because investors will be willing to pay a higher price for the firm's securities if they know that managers are being watched. When a firm takes out a bank loan, in effect, it hires the bank to certify that the firm is behaving efficiently (see EMPIRICAL EVIDENCE THAT BANKS ARE DELEGATED MONITORS).¹²

The firm's other investors also benefit from the bank's ability to renegotiate contract terms. In troubled times, a firm will often meet with a committee of its largest lenders to adjust its contracts. This committee invariably includes the firm's bankers, who represent both their own depositors and, indirectly, the firm's other bondholders. While the bank and other bondholders don't always have identical interests, everyone gains when a basically healthy firm avoids premature liquidation.¹³

¹²See Gorton and Haubrich, and Stiglitz (cited in A Selected Bibliography).

¹³Michelle White, "Economics of Bankruptcy: Liquidation and Reorganization," Working Paper No. 239, Salomon Brothers Center for the Study of Financial Institutions, New York University (1981), provides a good discussion of the differing interests of banks and bondholders.

The second reason why bank loans do not replace securities is that a bank, after all, is a firm much like any other firm. When savers lend to firms indirectly through a bank, they have not found a magic wand that makes agency problems disappear. The bank itself is an agent of its depositors, delegated to monitor on their behalf. Bank insiders know more than depositors about the bank's current revenues, about problem areas in the loan portfolio, and about the efficiency of bank management. Bank insiders have the same reasons as any other firm insiders to misrepresent results and to take advantage of perks. Since most depositors are unlikely to monitor their bank, they must have some device to control the behavior of bank insiders.

In fact, interest-earning deposits are a particularly simple type of debt contract that requires the bank to pay a return to its depositors. As in other debt contracts, the threat of bankruptcy gives the banker a powerful motive both to monitor the firms in its portfolio and to make required payments to depositors. Yet, this arrangement shares the vices of other debt contracts: inflexibility and the potential for a costly, premature liquidation of the bank's assets. When a bank fails, depositors may lose their

Empirical Evidence That Banks Are Delegated Monitors

Recent empirical tests in Christopher James, "Some Evidence on the Uniqueness of Bank Loans," *Journal of Financial Economics* (forthcoming) are largely consistent with the view that banks act as delegated monitors. James finds that when a firm announces a public debt offering, the firm's stock price falls. This is not surprising, because bondholders must be paid before stockholders can receive any payments. Yet, when a firm announces that it has signed a loan commitment with a bank, the firm's stock price rises. This is true despite the fact that banks, like bondholders, have priority over shareholders. This price rise may indicate that stockholders believe that the bank will supervise firm managers.^a

While this suggests that the market believes that banks play a special role, it does not *prove* that the market believes that banks are delegated monitors. For instance, an alternative hypothesis consistent with the evidence is that loan commitments raise the value of the firm by providing insurance against credit rationing or future increases in borrowing costs. Also, James finds that announcements of private placements lead to a decline in the borrowing firm's stock price. This is troublesome for the view that banks are delegated monitors, because the institutions that hold private placements—primarily insurance companies—have many similarities to banks.

^aEugene Fama, "What's Different About Banks?" *Journal of Monetary Economics* 15 (1985) pp. 29-36, uses a different approach and also finds evidence consistent with the theory of the bank as a delegated monitor.

funds and borrowing firms may be forced to engage in a costly search for alternative lenders. These costs must be weighed against the gains from having a delegated monitor.

If there were no bank regulation, this would be the whole story. But regulators monitor banks quite closely and enforce a weighty system of legal rules and restrictions. By monitoring bank behavior, regulators can reduce agency problems and reduce the likelihood of bank failures. In addition, regulators are often quite flexible in applying regulations to banks in difficulty. In this sense, bank regulators may be thought of as the bankers' bankers.¹⁴

On the other hand, bank regulations have a strong element of inflexibility, because they must apply to thousands of banks and cannot be tailored routinely to the needs or capabilities of any one bank. A bank will neither seek nor be granted an exception unless the bank is in serious trouble. While at least some of these regulations may be necessary for the stability of the banking system, their inflexibility must be reckoned alongside the other costs of intermediated finance.

Bank Diversification Reduces Agency Costs. While the agency costs of indirect lending help to explain why bank loans don't always replace direct securities, they also seem to pose a paradox. If depositors place their funds with banks to avoid the agency costs of direct lending, but simply end up with another agent who is difficult to monitor, how can bank loans ever be an improvement over direct lending?

Unlike the very best paradoxes, this one disappears upon further reflection. The problems of debt finance arise when a borrower with basically healthy prospects cannot make current payments. If the borrower has many separate

projects in different markets, however, it is very unlikely that all projects will go bad at once, unless the borrower is particularly inefficient or inept. Similarly, if a bank faithfully monitors a large portfolio of loans that includes different firms in many different markets, the probability of many firms facing troubles at once is quite small. And this probability falls as the bank's portfolio grows larger and more diversified.¹⁵

Even with diversification, the threat of bankruptcy forces the bank to monitor. If a bank is lackadaisical about the soundness of its loan portfolio, then many loans are likely to go bad and the bank will be unable to pay its depositors. But as long as the bank does monitor, the revenues from a large loan portfolio will tend to be stable. By monitoring, the bank reduces the likelihood of bankruptcy for its borrowing firms, and by holding a diversified portfolio, it lowers its own probability of bankruptcy. Thus, indirect lending through a delegated monitor that is well diversified actually reduces the wasted time and effort of premature bankruptcy proceedings.

SUMMARY AND OUTLOOK

Recent economic theory has provided new insights into the particular role banks play in credit markets and the essential differences between bank loans and marketed securities. When a firm requires outside finance, lenders either must monitor the firm's affairs or provide incentives for firm insiders to run the firm efficiently. Marketed securities do provide such incentives, but security holders will seldom be willing to bear the costs of monitoring the firm. By depositing their funds in a bank, savers hire an agent to make loans and monitor the investments on their behalf.

The goal of the theory of financial intermediation is to provide insights into the role of intermediaries and other contractual alternatives in credit markets. But these theoretical inquiries

¹⁴The deposit insurance system also reduces the costs of bank failures, because the failing bank's assets usually are purchased by another bank, or the bank is simply merged with another. Thus, most depositors lose nothing, and the costs to borrowing firms are substantially reduced.

¹⁵See Diamond, and Boyd and Prescott (cited in A Selected Bibliography).

may also interest crystal ball gazers who want to know whether marketable securities will increasingly replace bank loans as a source of funds for business.

Many observers have claimed that technological improvements have lowered the costs to individual security holders of obtaining and processing information about firms. In particular, the largest firms are watched closely by many market specialists, and individual investors may have found that the cost of purchasing and interpreting this information in a timely fashion is decreasing. In fact, the larger firms have reduced their reliance on bank loans, and money center banks that have traditionally specialized in providing services to larger firms have shifted away from commercial lending.¹⁶ Should infor-

mation costs continue to fall, the theory predicts that more firms will rely primarily on marketed securities.

At the same time, the theory provides a counterweight to predictions that banks' commercial lending will soon become a thing of the past. Since diversification reduces the agency costs of intermediated lending, greater opportunities to diversify loan portfolios should increase the efficiency of bank lending. Thus, the theory suggests that relaxed interstate banking restrictions should enhance banks' ability to compete in credit markets. Also, firms in unsettled markets and firms entering new markets should continue to rely primarily on bank loans, because bond contracts are too inflexible. Finally, since bank monitoring benefits all security holders, even firms that sell securities will continue to borrow through a mixture of bank loans and direct securities.

¹⁶See "Top 10 Business Loans Decline Again," *American Banker* (June 24, 1986) pp.1-38.



A Selected Bibliography

A Selected Bibliography

- Mitchell Berlin and Jan G. Loeys, "The Choice Between Bonds and Bank Loans," Federal Reserve Bank of Philadelphia, Working Paper No.86-18 (December 1986), shows why particular types of firms will borrow from banks and others will borrow from savers directly.
- John H. Boyd and Edward C. Prescott, "Financial Intermediary Coalitions," *Journal of Economic Theory* (April 1986) pp. 211-232, presents an elegant but mathematically difficult analysis of contractual alternatives to agency problems in credit markets.
- Timothy Campbell and William Kracaw, "Information Production, Market Signalling, and the Theory of Financial Intermediation," *Journal of Finance* (September 1980) pp. 863-882, is an early, easy to read treatment of intermediaries as agents that produce information about firms. The paper shows that institutions other than depository intermediaries can serve the same function.
- Douglas W. Diamond, "Financial Intermediation and Delegated Monitoring," *Review of Economic Studies* (August 1984) pp. 393-414, is the seminal article in the literature on banks as delegated monitors. It emphasizes diversification as a means of overcoming the agency costs of delegated monitoring.
- Gary B. Gorton and Joseph G. Haubrich, "Bank Deregulation, Credit Markets, and the Control of Capital," Working Paper, Rodney White Center for Financial Research, University of Pennsylvania (February 1986), presents a model of bank loans and marketed securities as complementary solutions to the agency problem and contains an insightful discussion of the effects of technological and regulatory changes on the relative shares of bank loans and marketed securities.
- Clifford W. Smith and Jerome B. Warner, "On Financial Contracting: An Analysis of Bond Covenants," *Journal of Financial Economics* (1979) pp. 117-161, is an exhaustive and fascinating analysis of the incentive effects of bond covenants.
- Joseph E. Stiglitz, "Credit Markets and the Control of Capital," *Journal of Money, Credit and Banking* (May 1985) pp. 133-152, provides a readable introduction to the literature on market failures in credit markets and explains how banks may play a special role in remedying these failures.

New Guidelines for Bank Capital: An Attempt to Reflect Risk

*Janice M. Moulton**

For many years, bank capital has been a steadying influence on the banking industry, buffering the risks that banks face. Now it is receiving new emphasis. U.S. federal bank regulatory agencies—the Federal Reserve, the Comptroller of the Currency, and the Federal Deposit Insurance Corporation—and the Bank of

England have proposed new guidelines aimed at establishing appropriate capital standards, which require that a minimum level of capital be held against assets.¹ Unlike the current standards,

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¹The Board's guidelines released for comment on February 12, 1987 are based upon the proposed U.S./U.K. agreement on primary capital and capital adequacy assessment. One policy objective is to develop a convergence in the supervision and treatment of capital of international banking organizations, a topic not covered explicitly in this article. The February 1987 proposed guidelines revise the Board's January 1986 proposal for a supplemental adjusted capital measure.

these new guidelines relate a bank's capital to the risk profile of its assets. Although some aspects of the new guidelines remain to be worked out, the Federal Reserve Board would use them in tandem with existing capital guidelines in the supervisory process.

Regulators proposed the risk-based guidelines in view of major changes occurring in the banking industry that have dramatically altered the risk-taking environment. For example, banks now are able to pay market rates on most deposits. Also, they can continue to expand into certain new activities, and some of these new activities, such as securities underwriting or real estate development, are believed by regulators to involve considerably more risk than, say, buying U. S. Treasury bills. In addition, banks have been expanding into what are called off-balance sheet activities. These involve potential, or contingent, claims on a bank rather than actual, current claims, and hence are not on the bank's balance sheet. These activities typically produce fee income for the bank, and include such items as financial guarantees and trade-related credit. Overall, banks now face a much broader spectrum of potential risks—with chances for large gains or large losses—when choosing which assets to invest in and which services to offer.

The new guidelines divide banks' assets into five broad categories that correspond to levels of riskiness. Included in those categories are some off-balance sheet items, such as commercial and consumer credit lines, and guarantees, which the current capital measure ignores. Accordingly, a bank that has more assets in the high-risk categories or more off-balance sheet items will need a greater amount of capital than a comparable size institution with more liquid assets and a lower risk profile. In general, most banks, except perhaps the very largest, will not need to raise additional capital to meet the new guidelines unless higher minimum capital ratios are imposed as part of the new guidelines. To illustrate the local effects, adjusted capital ratios were estimated for banks in Pennsylvania, New Jersey, and Delaware; these banks generally have

strong capital backing, and, indeed, their adjusted capital ratios are higher under the new guidelines. In the future, however, these guidelines will affect the distribution of capital among banks as well as incentives to invest in certain kinds of assets.

THE PURPOSES OF BANK CAPITAL AND HOW MUCH IS ENOUGH

The change in regulatory stance to a risk-adjusted capital measure that supplements the current capital guidelines points out the different functions that bank capital serves. Banks and their regulators may have quite different viewpoints about this matter, and correspondingly, about the appropriate amount of capital.

From the Bank's Viewpoint... Capital for a bank is primarily an investment in the institution, which carries a concomitant responsibility to return a yield to the investor. Bank capital can take the form of equity, such as common stock and perpetual preferred stock, or it can take the form of mandatory convertible debt issues that convert to stock at some future date. Reserves for loan losses and other contingencies also count as part of regulatory capital.² In effect, monies invested in the capital stock of a bank are available funds. Naturally, banks want to put that capital to use where it yields the most value per dollar invested in providing financial services to their commercial and retail customers, subject to risk constraints. However, each bank may emphasize different uses. For example, in a bank where top management believes its most important resource is its people, the emphasis

²For more discussion of the different items included in bank regulatory capital, see R. Alton Gilbert, Courtenay Stone, and Michael E. Trebing, "The New Bank Capital Adequacy Standards," Federal Reserve Bank of St. Louis Review (May 1985) pp. 12-20. The proposed definition of capital under the U.S./U.K. agreement in the new guidelines consists of base primary capital (such as common stock), which counts fully as primary capital, and limited primary capital (such as perpetual preferred stock and some mandatory convertible securities), which can count up to a specified percentage of base primary capital. See the Board's proposed guidelines, pp. 12-22 and 57-73.

will be on teaching employees new skills or reorienting their thinking to a riskier environment. Others will want to upgrade their technology in order to support their expansion into new activities and to modernize their operations. And banks that plan to acquire and merge with other banks need a sufficient capital base to allow such purchases and still meet regulatory capital standards.

In today's competitive marketplace, banks also prepare for the likelihood that they will accept some risks that result in unforeseen, negative effects on earnings. Banks use capital to buffer their unanticipated earnings losses. Without knowing exactly which losses will arise, bankers can plan for some overall dollar amount of losses on loans or investments, or losses through fraud, interest rate changes, and other factors. Banks, however, tend to weigh the costs—in terms of forgone earnings—of maintaining loan loss reserves and other buffers against earnings losses more heavily than the regulators do.³

...And From the Regulator's Viewpoint. Regulators are concerned not only about the safety and soundness of individual banks, but also about the banking system as a whole. They recognize that when a single bank fails, it may have adverse repercussions beyond that bank, particularly if it reduces public confidence in the ability of other banks to function normally. Regulators are responsible for ensuring public confidence in the banking system and in the payments mechanism, confidence that is essential to a safe and sound banking system. Therefore, regulators want to ensure that banks are managed prudently, with adequate internal controls, and that incentives encourage sound management practices for individual banks.

Sufficient capital is critical to achieving these

³In fact, one study finds that direct bankruptcy costs are negligible relative to the value of large banks. For a discussion of bank failure costs (and the associated leverage decision) in the 1930s and earlier, see Brian C. Gendreau, "The Private Costs of Bank Failures," this *Business Review* (March/April 1986) pp. 3-14.

goals of safety and soundness. For many years, regulators have emphasized the importance of holding a certain amount of capital against assets as a buffer against adverse circumstances, to buttress both individual banks and the system. Because of these broader concerns, regulators may demand more capital than banks would otherwise raise. At the same time, regulators stress that capital helps protect the solvency of the Federal Deposit Insurance Corporation (FDIC) fund. The FDIC goes a long way toward instilling confidence in the system by insuring individual accounts of depositors of commercial banks and savings banks up to \$100,000 in the event of a bank failure.⁴ Thus, if a particular bank goes under, small depositors are protected. The insurance fund, however, is a backup measure, to be used only when a bank's own resources are exhausted. To the extent that banks have sufficient capital to withstand earnings setbacks, those banks will not have to rely on the aid of the FDIC to bail out their depositors.

CAPITAL TRENDS

Regulators and Capital Since the ABC System. Regulatory views on capital have continually emphasized its importance to the supervisory structure. Moreover, the idea of risk-related capital requirements is not a new one; in the 1950s the Federal Reserve implemented a variant of this concept called the Analysis of Bank Capital (ABC) system.⁵ In some respects,

⁴Regulators also have proposed risk-related insurance premiums instead of the flat premium currently in effect. Conceptually, these insurance premiums would relate the overall risk (credit risk, interest rate risk, and so on) of an institution to the yearly premium paid; more risky institutions would pay more for their depositors' insurance. See "Deposit Insurance: Analysis of Reform Proposals," Staff Study of the U.S. General Accounting Office, Volume 1, September 30, 1986, and Mark J. Flannery and Aris A. Protopapadakis, "Risk-Sensitive Deposit Insurance Premia: Some Practical Issues," this *Business Review* (September/October 1984) pp. 3-10.

⁵For a critical review of the supplemental capital proposal and how it relates to the earlier ABC system, see Paul Horvitz, "Warming Over the ABC Idea," *American Banker* (February 26, 1986) pp. 4-5.

the ABC system was a precursor of things to follow. Using a very precise formula, the ABC approach required a certain percentage of capital to be held against different asset categories. For example, the formula required that banks hold 0.4 percent capital against U.S. Treasury bills and 10 percent capital against business loans. Off-balance sheet items entered indirectly through a capital requirement against trust department activities equal to a certain percent of trust earnings.⁶ Another forerunner of things to come was that small banks were thought to have fewer opportunities to diversify their portfolios, and therefore, they were subject to what was effectively a higher capital requirement than large banks. (There was a fixed capital amount, which translated into a higher percent of assets for small banks.) As the ABC system evolved over the years, it became more complex, more precise, and more difficult to administer. It was finally dropped in the mid-1970s because adequate capital levels could not be agreed upon.

For the next few years, regulators persuaded or cajoled banks into increasing capital when needed and, in extreme cases, required a bank to formulate a plan to raise capital. It wasn't until 1981 that federal bank regulators announced minimum primary capital-to-asset ratios. Primary capital consists mainly of equity, undivided profits, capital reserves, and reserves for loan losses—all of which are on banks' balance sheets.⁷ But, at first, the regulators differed somewhat in setting the minimum requirements. The FDIC adopted a minimum primary capital-to-asset

ratio of 5 percent. The Fed and the Comptroller set the ratio at 6 percent for banks under \$1 billion in assets and at 5 percent for banks over \$1 billion in assets, called regional banks. At that time, the capital-to-asset ratios of the 17 largest U.S. banks—often known as multinationals—were considered on an individual basis, depending upon the overall characteristics of each banking organization. In 1983, armed with new authority from the International Lending and Supervision Act, regulators adopted a (generally higher) minimum capital requirement for the largest banking organizations of 5 percent, the same as the regionals.⁸ Two years later, in 1985, all three federal regulators agreed on *uniform* capital ratios—5.5 percent for primary capital and 6 percent for total capital—for all banks, regardless of size.⁹

How Have Capital-to-Asset Ratios Changed?

After hitting a low point in the late 1970s following the demise of the ABC System, capital-to-asset ratios have risen for commercial banks in the U.S. during the 1980s, as regulators raised minimum capital requirements (see PRIMARY CAPITAL-TO-ASSETS RATIOS ARE RISING). In December 1980, commercial banks, on average, had primary capital equal to 6.3 percent of their assets, while by December 1986, their capital had risen a percentage point to 7.2 percent of assets. These average figures obscure differences among size classes, however. Small banks (those with less than \$200 million in assets) long have maintained strong capital-to-asset ratios, and currently average 8.8 percent across the nation. In contrast, larger banks, encouraged by regulators, have raised substantial amounts of new capital in the last few years. Since 1980,

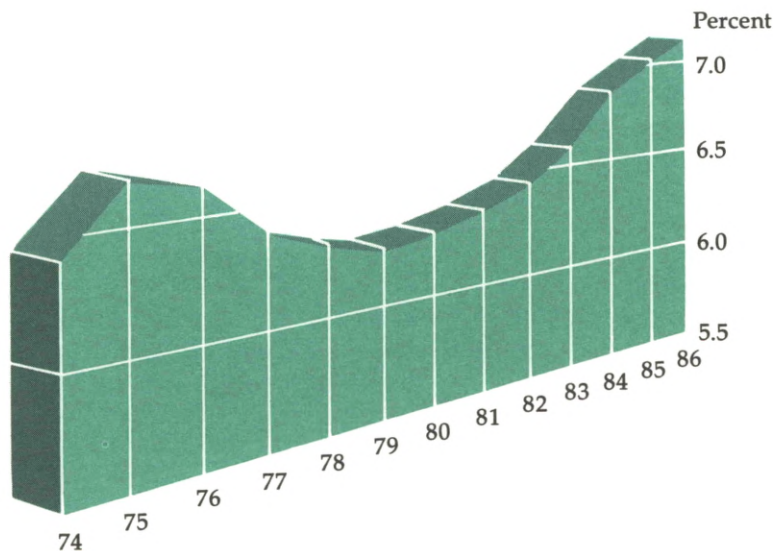
⁶Though trust activities are not the sort of off-balance sheet exposure that the new guidelines are aimed at, trust department assets are not on the bank's balance sheet. (Trust income is reported on the income statement.) A capital requirement against gross trust earnings reflected the risk that lower trust earnings might adversely affect the bank's earnings.

⁷Minimum ratios were also set for a bank's total capital (primary capital plus subordinated notes and debentures and some other items); these minimums usually were a half percentage point higher than the primary capital-to-asset ratios.

⁸Bank holding companies must meet the same minimum capital ratios as banks, although the components included in capital differ slightly.

⁹The regulators also established numerical zones for total capital for banks with more than \$1 billion in assets. These zones set out objective standards on how the total capital ratio works with the minimum primary capital ratio, depending upon asset quality and other financial concerns.

Primary Capital-to-Asset Ratios Are Rising



SOURCE: *Statistics on Banking* (Washington, DC: FDIC, various years). These data are from year-end call reports for all insured commercial banks' domestic and foreign offices.

banks with assets between \$1 billion and \$10 billion have raised their capital ratios nearly one-half of a percentage point, to 6.6 percent. And the largest banks (greater than \$10 billion in assets) have increased their capital ratios from 4.4 to 6.6 percent over the same period. Taken altogether, these numbers appear to support the claim of a stronger capital base for the banking system than a few years ago.

These numbers tell only part of the story, however, because the existing capital ratio is not sensitive to the risk exposure of the bank's assets nor does it capture off-balance sheet assets. Two banks can have the same capital ratio and the same asset size, but very different overall risks to their earnings streams if each invests and manages in a unique way. These sorts of differences are what the new guidelines hope to address.

THE FEDERAL RESERVE'S NEW CAPITAL GUIDELINES

The Purpose. The basic purpose of the new guidelines is to relate a bank's capital to its risk profile so that higher risk activities require relatively more bank capital. Accordingly, the guidelines allow capital standards to reflect developments in the banking industry that alter asset risk. Two important developments affecting bank risk have been the growth of off-balance sheet assets, such as standby letters of credit and consumer commitments, which are not included in the standard capital-to-asset ratio because they aren't counted as assets, and the reduction in liquid assets.

Banks have taken on additional risks via off-balance sheet activities, risks that now represent a substantial credit exposure. For example, standby letters of credit, where the bank "stands

by" ready to make payment in case the firm defaults on its transaction, pose a contingency risk because the bank may need to make good on its promise to provide payment. (These increased from 5.8 percent of the assets of U.S. banks at the end of 1981 to 11.4 percent in mid-year 1985.) Similarly, loan commitments expose the bank to risk because the bank promises to make a loan in the future at the customer's demand. Regulators recognized that implicitly banks—particularly large banks—had an incentive to circumvent existing capital requirements by adding these and other off-balance sheet items to earn fee income.

Banks also have reduced their holdings of liquid assets relative to total assets in the last few years. Indeed, for U.S. multinationals, the proportion of liquid assets to total assets fell from 15.6 to 12.8 percent from 1981 to 1985. Liquid assets—such as other institutions' certificates of deposit, federal funds sold, and short-term securities which are easily converted into cash—enable a bank to meet unexpected withdrawals, earnings losses, and so on. But generally, banks that are more aggressive in their funds management have substituted higher yielding, higher risk assets for lower yielding, lower risk assets. Since many higher risk assets are also less liquid, regulators grew concerned that the current incentives encourage holding a higher risk portfolio at the expense of holding liquid assets.

In responding to these developments, regulators contend that the risk-based guidelines will reduce the (distorted) incentives to shift into off-balance sheet assets by requiring capital backing for them. And they hope to stop the downward trend in the proportion of low-risk assets banks hold by requiring less capital to back them.

How Do the New Guidelines Classify Assets According to Risk? The guidelines chart a bank's risk profile by establishing a relationship between assets and five general categories of risk, to be weighted at 0, 10, 25, 50, or 100 percent. Each asset is assigned a category depending on its credit risk, which is based mainly on the type of

borrower. The risk categories cover both assets that are in the standard ratio as well as off-balance sheet assets. Off-balance sheet assets convert to a balance sheet equivalent before being placed in a risk category. Interest rate and foreign exchange contracts incorporate more complex conversion factors. (See RISK CATEGORIES, ASSETS, AND CONVERSION FACTORS: A SUMMARY, p. 26.)

Asset categories place cash and balances with Federal Reserve Banks in the lowest risk class, with a weight of 0 percent, meaning that cash and Federal Reserve deposits require no capital backing. Put another way, banks that wish to expand these assets can do so without adding regulatory capital. The next category receives a 10 percent weight. It includes claims that are backed by the full faith and credit of the U.S. government and that are highly liquid. Some examples are short-term U.S. Treasury securities and short-term claims on U.S. government agencies, such as the Government National Mortgage Association (Ginnie Mae) and the Federal Housing Administration. The 25 percent category captures long-term U.S. Treasury securities and long-term claims on U.S. government agencies. Though there is no risk of default, the higher weight reflects the interest rate risk inherent in the longer maturity—the risk that the price of the security will rise or fall as interest rates fluctuate. Short-term interbank claims, whether domestic or foreign, also fall within this category; for example, fed funds sold to a domestic bank and certificates of deposit of a foreign bank are treated alike.

Assets that generally have more credit risk than those in the above categories but less credit risk than the typical commercial bank loan fall in the 50 percent category. This category includes claims on U.S. government-sponsored agencies, such as mortgage-backed securities issued by the Federal Home Loan Mortgage Corporation (Freddie Mac) and the Federal National Mortgage Association (Fannie Mae). These claims are considered somewhat more risky because they are not explicitly guaranteed by the full

faith and credit of the U.S. government. General obligation debt of state and local governments also falls in this category. Assets in the highest risk category receive a 100 percent weight, meaning they count fully as assets when calculating the risk-adjusted capital ratio. Many of the usual bank assets fall within this group, including commercial and industrial loans, residential real estate loans, and consumer loans. So do corporate securities, commercial paper, and loans to foreign governments.

Off-balance sheet assets are included in the guidelines on a “credit equivalent” basis; that is, the face amount of the item is multiplied by a conversion factor to make it into an on-balance sheet equivalent credit, which then is assigned a risk category. The proposed guidelines apply a 100 percent conversion factor to financial guarantees that are effectively a direct extension of credit to the customer. Such direct credit substitutes would include standby letters of credit that back repayment of commercial paper or other commercial loans. Trade-related guarantees like commercial letters of credit convert at 50 percent; they present a contingency risk to the bank if the party defaults on its obligations or does not perform up to standard. Another group of off-balance sheet items that represent commitments to extend credit have various conversion factors depending upon the maturity, such as overdraft facilities, revolving credit, and home equity lines; the unused portion of these credit lines counts as an asset, too.

In the February 1987 proposed guidelines, the regulators expressed a desire to include the credit risks of *interest rate swaps and forward foreign exchange contracts* in the risk-based capital measure, and in March, the Federal Reserve proposed a way to do that.¹⁰ The proposal is aimed at only the largest banking organizations and is consis-

tent with the credit equivalent approach used in the treatment of other off-balance sheet assets. The credit equivalent amount is the sum of both a measure of potential exposure and current exposure. Potential exposure represents the risks that may arise later in the contract because of fluctuations in interest rates or exchange rates; it is calculated by multiplying the conversion factor times the notational value of the contract. Current exposure is simply the marked-to-market value—that is, the amount the banking organization would have to pay in today’s market to replace the net payment stream in the contract. See EXAMPLE OF CAPITAL-TO-ASSET CALCULATIONS (p. 32) for an illustration of the calculations involved in the risk-adjusted measure.

How Will the Guidelines Be Used? The Federal Reserve is careful to stress the *supplemental* nature of the new capital guidelines. That is, these guidelines add to the current capital guidelines rather than replace them.¹¹ But federal bank regulators disagree on this matter—the Federal Reserve and the FDIC agree that the risk-based ratio would be used in tandem with existing capital ratios, while the Comptroller wants the risk-based capital ratio to replace the existing minimums for all national banks. To the extent that the adjusted ratio requires less capital, the Comptroller’s proposal would allow banks to reduce their regulatory capital, an outcome the Fed is strongly opposed to. Aside from this issue, however, the regulators are in basic agreement, and this difference may be resolved before the final guidelines are released.

In accordance with the supplemental concept, the Fed views the risk-adjusted capital measure as an additional component in the supervisory

¹⁰For an understandable discussion of interest rate swaps and how they work, see Jan G. Loeys, “Interest Rate Swaps: A New Tool for Managing Risk,” this *Business Review* (May/June 1985) pp. 17-25.

¹¹The framework for setting the minimum level for the risk-adjusted capital measure assumes the current minimum capital standards will remain the same for primary and total capital. However, the Federal Reserve probably will establish new numerical zones for banks with over \$1 billion in assets to replace the zones currently used for total capital, and these new zones may be higher. These zones would set out objective standards on how the risk-adjusted ratio would work in tandem with the minimum primary capital ratio.

Risk Categories, Assets, and Conversion Factors: A Summary

Asset Risk Categories

0 Percent Weight

- Cash—domestic and foreign
- Claims on Federal Reserve Banks

10 Percent Weight

- Short-term claims (1-year or less) on U.S. government and its agencies

25 Percent Weight

- Cash items in process of collection
- Short-term claims on U.S. depository institutions, foreign banks, and foreign central banks
- Long-term claims on U.S. government and its agencies
- Claims collateralized by cash or U.S. government or agency debt (including repurchase agreements)
- Claims guaranteed by the U.S. government or its agencies
- Local currency claims on foreign central governments to the extent that bank has local currency liabilities
- Federal Reserve Bank stock

50 Percent Weight

- Claims on U.S. government-sponsored agencies
- Claims collateralized by U.S. government-sponsored agency debt (including repurchase agreements)
- General obligation claims on states, counties, and municipalities
- Claims on multinational development institutions

100 Percent Weight

- All other assets not specified above, including:
 - Long-term claims on domestic and foreign banks
 - Claims on private entities and individuals
 - All other claims on foreign governments and private obligors

Selected Off-Balance Sheet Assets and Conversion Factors

Off-Balance Sheet Assets	Conversion Factors
<ul style="list-style-type: none"> • Direct credit substitutes <ul style="list-style-type: none"> - Financial guarantees - Standby letters of credit 	100 percent
<ul style="list-style-type: none"> • Sales and repurchase agreements and asset sales with recourse 	100 percent

Off-Balance Sheet Assets

- Trade-related contingencies
 - Commercial letters of credit
 - Bid and performance bonds
 - Performance standby letters of credit
- Other commitments
 - Commercial and consumer credit lines (including home equity lines)
 - Overdraft facilities
 - Revolving underwriting facilities
 - Underwriting commitments



Maturity^a
 Over 5 years
 1-5 years
 1 year or less

Conversion Factors

50 percent

 50 percent
 25 percent
 10 percent

Interest Rate and Foreign Exchange Contracts and Conversion Factors

Interest Rate Contracts

- Single currency interest rate swaps
- forward rate agreements
- interest rate options purchased

Exchange Rate Contracts

- Cross currency interest rate swaps
- forward foreign exchange contracts
- foreign currency options purchased

Exclusions

- Spot foreign exchange contracts
- futures and options contracts traded on organized exchanges and marked-to-market daily.

Conversion Factors for Calculating Potential Exposure^b

Remaining Maturity	Interest Rate Contracts	Exchange Rate Contracts
Less than 3 days	0 percent	0 percent
3 days to 1 month	0 percent	1 - 2 percent
1 month to 3 months	0 percent	2 - 4 percent
3 months to 1 year	0 percent	4 - 8 percent
1 year or more	0.5 - 1.0 percent per complete year	5 - 10 percent plus 1 - 2 percent per complete year

^a Maturity is the original maturity date or the earliest possible time that the bank may unconditionally cancel the commitment, whichever comes first.

^bThe methodology used in determining the conversion factors is explained in a technical working paper by the Staff of the Board of Governors, titled "Potential Credit Exposure on Interest Rate and Exchange Rate Related Instruments." Estimates were made of the probability distributions of potential replacement costs for various contracts over their remaining life, assuming matched pairs of contracts. The confidence limits for these distributions correspond to the ranges for the conversion factors.

structure, to be taken together with other quantitative and qualitative information. It would add significantly to the off-site information regulators gain through financial statement analysis and surveillance techniques, which are important in tracking a bank's ongoing financial condition. The adjusted measure would also be used in conjunction with the on-site information gained during the examination of a bank and its records. For example, examiners look at collateral and guarantees associated with loans, both important factors affecting credit risk. Examiners also consider the concentration of assets in various industries when assessing the risk of the portfolio.

HOW WILL THE GUIDELINES AFFECT CAPITAL RATIOS IN THE TRI-STATE AREA?

Banks in Pennsylvania, New Jersey, and Delaware generally have strong capital positions. The same factors that lead to the healthy financial condition of these banks, the superior asset quality, and the low incidence of problem banks have enabled them to build up their capital at a moderate pace.¹² Over the last few years, banks in the tri-state area have raised their average capital-to-asset ratio, but not by as much as the typical U.S. bank. Currently, the average capital ratio for banks in the tri-state area is 7.02 percent, just under the 7.20 percent national average, and considerably above the 5.5 percent minimum regulatory standard.

Table 1 compares the capital ratios under the old and new guidelines for banks of different size classes in Pennsylvania, New Jersey, Delaware, and the region as a whole. The standard capital-to-asset ratios in the top portion of the table clearly show area banks are starting from a strong position as they move to the adjusted

capital measure. The bottom portion gives estimates of how banks in this region would be affected by the proposed guidelines, using the asset risk categories and off-balance sheet assets (other than foreign exchange and interest rate swaps), and associated weights. Because these estimates required numerous assumptions about the data for individual bank assets, they are best viewed as illustrative of the effects, and are not to be interpreted as precise measurements.¹³ Nevertheless, the estimated risk-adjusted ratios for area banks are well above the existing minimum capital requirements, and, in fact, are consistently higher than the current capital ratios. Banks in each size classification have higher ratios, from a gain of 1 percentage point for large banks to a gain of nearly 3 percentage points for small banks. What's more, even the few banks in the region that currently have standard capital ratios under 5.5 percent will find their estimated ratios to be substantially higher.

The risk-adjusted ratios were also estimated with interest rate and foreign exchange contracts included with other off-balance sheet items. For banks under \$5 billion, the estimates change barely at all, while banks over \$5 billion experience a 0.3 percent drop in their capital ratios. These results suggest that even large regional banks in the tri-state area have minimal exposure to off-balance sheet risk from these types of contracts, and would experience little effect if the guidelines should be extended in this fashion.

¹³Many assumptions were necessary to estimate the adjusted capital-to-asset ratios using call report data because the data are not entered in the same way as the items in the risk categories. For example, asset categories in the proposed guidelines distinguish between claims collateralized by U.S. government or agency debt (25 percent) and claims collateralized by U.S. government-sponsored agency debt (50 percent). Line items on the call report, however, do not tell what percent of claims, such as repurchase agreements, are collateralized, much less what form the collateral takes. A complete listing of these types of assumptions is available on request from the author.

¹²For a discussion of the financial condition of these banks, see Thomas K. Desch and Richard W. Lang, "The Health of Banking in the Third District," this *Business Review* (September/October 1985) pp. 3-11.

TABLE 1
Comparing Current and Proposed
Capital Measures

Total Assets (in millions)	Primary Capital-to-Asset Ratios			
	Delaware ^a	New Jersey	Pennsylvania	Tri-State
		Current		
Below \$200	8.80	7.39	9.48	8.89
\$200-\$400	7.10	6.35	8.21	7.53
\$400-\$1,000	6.52	6.75	7.80	7.41
\$1,000-\$5,000	6.90	6.66	7.03	6.82
Above \$5,000	—	6.10	6.57	6.52
Average	6.99	6.64	7.20	7.02
		Proposed ^b		
Below \$200	11.59	9.73	12.52	11.74
\$200-\$400	8.27	8.03	10.24	9.41
\$400-\$1,000	6.73	8.31	9.99	9.32
\$1,000-\$5,000	8.25	8.07	8.76	8.34
Above \$5,000	—	7.72	7.47	7.50
Average	8.25	8.20	8.50	8.40

SOURCE: Data are from December 31, 1986 call reports.

^aDelaware banks include only the home-state banks, not Financial Center Development Act banks or consumer credit banks.

^bProposed estimates exclude foreign exchange and interest rate contracts.

These findings are not surprising, despite the fact that the debate surrounding this risk-based proposal has focused on the increased risks that banks are taking. One explanation for the strong showing of area banks is that three of the five proposed asset risk categories are weighted at substantially less than 100 percent, and cash-type assets not at all, in summing up the assets. For area banks, this change apparently more than compensates for the addition of some off-balance sheet assets (at the various weights) in the calculation.

Another reason why area banks come out stronger under the proposed guidelines is their moderate size. Typically, the largest banks are most likely to engage actively in off-balance

sheet activities, including guarantees that are related to loan commitments, standby letters of credit, and so forth. Small banks, in contrast, tend to hold larger proportions of liquid assets, which would fall into the lower risk categories. In the tri-state area, only about 45 banks are larger than \$1 billion in assets, while nearly three-fourths are under \$200 million in assets. Table 2 (p. 30) illustrates the proportion of off-balance sheet assets to primary capital for area banks. The calculations show that, overall, about 26 percent of the 426 banks have off-balance sheet assets greater than their primary capital, and the largest banks, those above \$5 billion, have the highest average ratio at 5.9. When interest rate and foreign currency contracts are

TABLE 2
Off-Balance Sheet Activity for Banks in Tri-State Area
Average Ratio of Off-Balance Sheet Items to Primary Capital

Bank Size (Total Assets in millions)	Number of Banks	Proposed Guidelines		With Foreign Exchange and Interest Rate Swaps	
		% of Banks	OBS/C Ratio	% of Banks	OBS/C Ratio
Below \$200	297	10.8%	1.79	10.8%	1.79
\$200-\$400	45	37.8	1.93	40.0	1.95
\$400-\$1,000	37	64.9	2.14	67.6	2.58
\$1,000-\$5,000	38	76.3	2.70	78.9	3.01
Above \$5,000	9	100.0	5.85	100.0	8.29
TOTAL	426	26.0%	—	26.8%	—

NOTES: To focus on those banks with the most off-balance sheet activity, only banks with ratios of off-balance sheet items to primary capital (OBS/C) greater than 1.0 are included in the last four columns.

Off-balance sheet items, including foreign exchange and interest rate contracts, are included at their full value, not the credit equivalent, in the calculations.

added, the percent of banks involved remains about the same, but the level of off-balance sheet exposure relative to primary capital rises somewhat further for the largest banks.

WHAT LIES AHEAD? SOME OPEN ISSUES

The risk-adjusted capital guidelines are a regulatory response to the increased variety and higher level of risks that banks face in today's financial system. These guidelines were developed in close cooperation with the Bank of England in an effort to agree on a uniform standard. More particularly, they are intended to eliminate some distortions that have arisen in recent years in the incentives to hold liquid assets and to expand into off-balance sheet activities. Through the guidelines, the risk exposure of a bank is related to five major categories of asset risk, ranging from highly liquid and marketable assets to typical commercial loans. Because of the weights chosen for the different risk categories, few banks nationally, and probably none in the tri-state area, will need to raise new capital to meet the guidelines. The

incentives to hold capital against various assets will become more explicit, however, resulting in some redistribution of capital both within and among banks.

These proposed guidelines have stirred debate on at least three issues that regulators and bankers must grapple with as the guidelines are implemented. The first issue concerns the potential for credit allocation. By their nature, the risk-based guidelines attempt to restructure capital incentives for holding different assets. Since more capital must be held against assets in the higher risk categories, bankers have an incentive to reduce those assets and increase assets in lower risk categories. And the use of credit conversion factors for off-balance sheet assets, while tailoring the guidelines to individual items, increases the chances of credit allocation. Moreover, there is considerable disagreement on whether particular assets, such as loan commitments, are assigned to the right categories. As a result, some critics oppose the guidelines on the grounds that regulators should not become involved in credit allocation. Regu-

lators respond that they want to clarify the relationship between credit risk and capital so that bankers can take these general risk categories into account when choosing their activities and assets. Since the guidelines formally recognize that more capital is needed to back higher risk assets, regulators appear willing to accept some redirection of resources. This acceptance stems from a belief that, in total, the risk-adjusted guidelines are not introducing new distortions, but are simply eliminating old ones.

The second issue focuses on the ways in which the adjusted capital ratio is a partial measure of the riskiness of a bank's assets, and some perceived disadvantages to that approach. The guidelines' five broad risk categories would surely be more finely divided for a truly risk-based measure. Further, the guidelines look at only one asset at a time and ignore diversification effects. They do not attempt to incorporate the interaction among the different asset returns or the presence of a common factor among assets, which would be part of the assessment of the riskiness of the whole portfolio. A well-diversified portfolio of assets does not concentrate too heavily on assets in one industry or area, so that adverse economic conditions in one sector do not overwhelm the entire portfolio. In addition, the risk-adjusted measure emphasizes the credit risk of the asset and not the risks that banks face due to interest rate changes, exchange rate movements, and so on (although the March proposal was a step in that direction). Regulators are well aware of the limitations inherent in the risk-adjusted capital ratio. They also want to find the balance between the need for quantitative analysis and the need for subjective judgment

that is critical to the examination process. Thus, a comprehensive evaluation of the different risks that banks face need not be part of the risk-adjusted ratio since this analysis is covered within the supervisory and examination framework.

A third unresolved issue centers on how these guidelines will evolve over time. Will the risk-adjusted guidelines receive greater emphasis over time relative to the standard capital ratios? How will they be integrated with the examination process? Will the regulatory agencies attempt to expand the risk measure to make it more comprehensive? The regulatory agencies already have taken steps to fine-tune the proposed guidelines by adding conversion factors and by expanding the coverage of off-balance sheet assets. What other adjustments lie ahead? Finally, will regulators set the minimum capital standards for the risk-adjusted measure above 5.5 percent, the current minimum for primary capital, and perhaps raise them later?¹⁴ If so, the guidelines will have more of a bite in the future.¹⁵

These issues and the questions they raise point to the complexity of the task ahead. The risk-adjusted approach to regulatory capital entails major changes that will take a while to work out. Whatever precise form it takes, the risk-adjusted capital measure will be a significant regulatory tool in assessing the capital position of a banking organization.

¹⁴The Federal Reserve has not set an overall capital rate.

¹⁵The guidelines also would have more of a bite if loan-loss reserves were phased out of primary capital. The Board raised this possibility and asked for comment.

Example of Capital-to-Asset Calculations

Under the proposed guidelines, where all assets are multiplied by risk weights, calculating the ratio of capital to assets involves several steps. Assets on the balance sheet are simplest: they are just multiplied by their risk weights. Off-balance sheet items are more complex because "credit equivalents" must be determined before multiplying by the risk weights. For off-balance sheet items other than interest rate and foreign exchange contracts, the credit equivalent equals the dollar value of the asset times a conversion factor. For interest rate and foreign exchange contracts, calculating the credit equivalent involves one more step: after multiplying the dollar value of the asset times the conversion factor to get the potential exposure, the current exposure (the marked-to-market value) is added.^a

To see these calculations played out, imagine a bank with \$100 million in on-balance sheet assets distributed among each of the asset risk categories, a selected mix of \$100 million of off-balance sheet assets, and primary capital equal to \$7 million.^b

Balance sheet assets	\$100 million
Off-balance sheet assets	
Standby letters of credit	20 million
Consumer credit lines (3-yr.)	40 million
3-mo. forward foreign exchange contract	10 million
3-yr. fixed/floating interest rate swap	30 million
Primary capital	7 million

Step 1. Calculate risk-weighted balance sheet assets.

Asset Category	Balance Sheet Assets	Weighted Assets
0%	5	0
10%	15	1.50
25%	25	6.25
50%	15	7.50
100%	40	40.00
		55.25

^aA positive marked-to-market value means that the bank suffers a loss when the counterparty defaults on the contract and the bank has to replace it. A negative marked-to-market value for a contract indicates a default would result in a (theoretical) profit for the bank. However, a negative marked-to-market number may offset the amount of potential exposure (from future rate changes) only until the credit equivalent amount falls to zero.

^bFor the purposes of illustration, the following assumptions are made:

- (1) all off-balance sheet items are claims on individuals or private entities, so their risk categories are 100 percent;
- (2) the current exposure numbers in Step 3 are purely illustrative and represent the marked-to-market value of the contract as of the reporting date;
- (3) the conversion factors in Step 3 are at the lower end of the range.

Step 2. Calculate credit equivalents for off-balance sheet items other than interest rate and foreign exchange contracts.

Off-balance Sheet Asset	Nominal Amount	×	Conversion Factor	=	Credit Equiv.	×	Asset Category	=	Weighted Assets
Standby Letter of Credit	20		1.00		20		100%		20.00
Consumer Credit Line (3-yr. maturity)	40		0.25		10		100%		10.00
									30.00

Step 3. Calculate credit equivalents for interest rate and foreign exchange contracts.

Off-balance Sheet Asset	Nominal Amount	×	Conversion Factor	=	Potential Exposure	+	Current Exposure	=	Credit Equiv.	×	Asset Cat.	=	Weighted Assets
3-mo. forward foreign exchange contract	10		0.04		0.4		0.1		0.5		100%		0.50
3-yr. fixed/floating interest rate swap	30		0.015		0.45		-0.2		0.25		100%		0.25
													0.75

Step 4. Calculate ratio of capital to assets.

Current guidelines: \$7 million/\$100 million = 7 %

Proposed guidelines: \$55.25 million
 \$30.00 million
 \$ 0.75 million
 \$7 million/\$86.00 million = 8.14 %

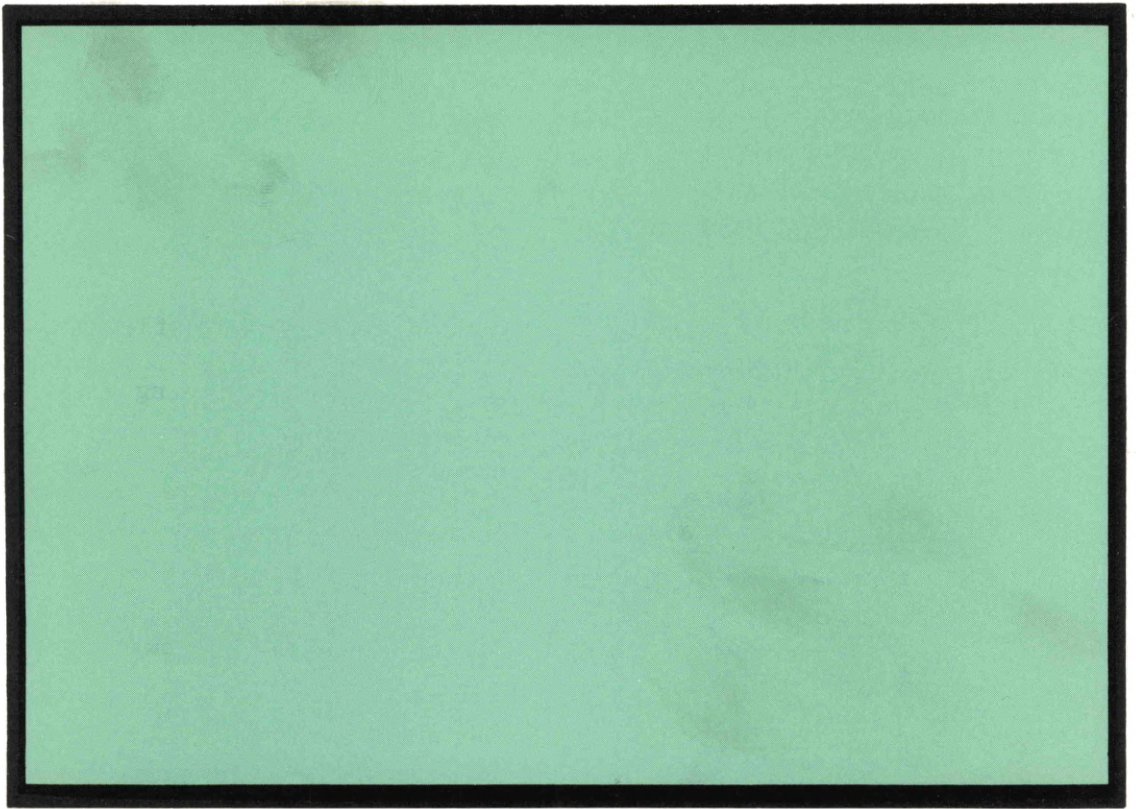
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