

# FDIC Banking Review

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- **Safety Net, Subsidies,  
and Financial  
Modernization**
  - **Internal Risk-  
Management Models**
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## *The Federal Safety Net, Banking Subsidies, and Implications for Financial Modernization*

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This regular feature of the *FDIC Banking Review* contains information on regulatory agency actions, state legislation and regulation, and articles and studies pertinent to banking and deposit insurance issues.

# The Federal Safety Net, Banking Subsidies, and Implications for Financial Modernization

by Kenneth Jones and Barry Kolatch\*

Many policymakers and economists have long maintained that the federal safety net—broadly defined as federal deposit insurance and access to the Federal Reserve’s discount window and payments system—endows insured depository institutions with a financial subsidy and with certain other, nonfinancial, competitive advantages. Some have also asserted that banks could conceivably pass cost advantages on to their bank subsidiaries and affiliates—in essence, extending the safety net (and taxpayer liability) to activities for which it was not intended. Indeed, this latter argument has long been used to justify constraints on permissible banking activities, and it has recently been echoed in Congressional hearings on financial modernization.<sup>1</sup> During hearings on proposed financial modernization legislation, the presumed existence of a government subsidy and a bank’s ability to pass it to its subsidiaries led some witnesses to recommend that the proposed legislation mandate the bank holding company structure in preference to the bank subsidiary structure: they argued that transferring a subsidy from a bank to an affiliate within the holding company structure is harder than transferring a subsidy within the bank subsidiary structure. Other witnesses countered that the evidence did not support the notion that banks receive a significant safety net–related subsidy at the present time and that, in any case, organizational structure was unlikely to have a marked effect on a bank’s ability to transfer a subsidy. Members of Congress believed that resolving the subsidy question was particularly important because, aside

from its competitive implications, the answer would largely determine the future legal and operational structure of diversified financial-service providers in the United States as well as the regulatory regime responsible for their oversight.

Because of the importance of the subsidy question, this article reexamines the issue, but does so in light of recent regulatory reforms prompted by the thrift and banking crises of the 1980s. A number of these reforms were designed specifically to do two things: reduce the safety net–related advantages that had been accruing to insured depository institutions, and correct perverse incentives created by the safety net’s existence. After reassessing the traditional arguments supporting the existence of safety net–related subsidies and their competitive implications, the article argues that for public-policy purposes the relevant question is not whether a gross subsidy exists, but whether a net marginal subsidy remains after full account is taken of all offsetting costs of government regulation, costs both explicit and implicit. Finally, the article discusses the effectiveness of firewalls and other regulatory efforts to prevent the transfer of any subsidy and to limit taxpayer exposure.

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<sup>1</sup> U.S. House (1997) and U.S. Senate (1998).

Our analysis will indicate that the federal safety net and its related gross subsidy have been significantly constricted in recent years and that any funding advantage derived from the safety net appears to be largely offset by the direct and indirect costs associated with government regulation. Although not all these costs are incurred on the margin, the evidence indicates that if a net marginal subsidy exists at all, it is very small. Moreover, regulatory firewalls (such as those embodied in the Comptroller of the Currency's operating subsidiary rules and in Sections 23A and 23B of the Federal Reserve Act) serve to inhibit a bank from passing a net marginal subsidy either to a direct subsidiary or to an affiliate of the holding company. In both cases, any leakage of a net marginal subsidy would be *de minimis*. Consequently, unless there are other compelling public-policy reasons for mandating a particular organizational form, we conclude that financial institutions should be given the flexibility to choose the corporate structure that best suits their needs, provided adequate safeguards remain in place to protect the insurance funds and to guard against undue expansion of the safety net.

This article first discusses the sources of the safety net-related gross government subsidy and the recent legislative, regulatory, and market developments designed to reduce the size of the safety net and its related gross subsidy. The second section reviews efforts to measure the subsidy; introduces the importance of differentiating among gross, net, and net marginal subsidies; and discusses how offsetting costs associated with deposit insurance, reserve requirements, regulatory burden, and other operating expenses serve to minimize any gross subsidy that banks may receive. The third section discusses how regulatory firewalls inhibit the transfer of any safety net-related subsidy under both the bank subsidiary structure and the bank holding company structure. The article concludes with the policy implications of our analysis.

### ***The Safety Net and Government Subsidization of Banking: Sources and Recent Restrictions***

It is widely recognized that banks receive a *gross subsidy* from the federal safety net. In terms of funding costs, this means that, for any given level of capital, banks can borrow funds at a lower interest rate than they could in the absence of the safety net. During the past decade, however, a number of statutory and regulatory changes have lessened the subsidy considerably.

### ***Sources of the Gross Subsidy***

The three primary sources of the gross subsidy enjoyed by commercial bank and thrift institutions are deposit insurance, the discount window, and access to Fedwire, the Federal Reserve's large-dollar electronic payments system.

**Deposit Insurance.** The purchase of deposit insurance allows a bank to lower its risk profile and therefore operate with less capital and a lower cost of funds (lower, because some of the risk premium previously paid on borrowed funds is recaptured). However, the lower cost of funds would not in and of itself constitute a subsidy as long as the bank paid an actuarially fair "market premium" for the insurance. For example, municipalities often purchase municipal bond insurance to enhance municipal bonds. The savings, in terms of lower yields on the bonds, exceed the cost of purchasing the insurance (otherwise municipalities would not buy it). Nonetheless, the municipalities are not receiving a subsidy. By purchasing insurance from a AAA-rated company, they are merely capturing some of the risk premium they would have had to pay to get investors to purchase their riskier securities. Only if the insurance is mispriced (underpriced) does a financial subsidy begin to appear. In the case of depository institutions, the existence of underpriced deposit insurance would allow an insured institution to gather funds (deposits) more cheaply than a noninsured financial institution with a similar capital structure. Moreover, to the extent the public believes that uninsured deposits and other bank liabilities will also be protected by deposit insurance or other implicit government guarantees, the cost of other bank liabilities could be lower than they would be without the safety net.<sup>2</sup> Since banks are not charged for this credit enhancement, a gross subsidy can be said to exist.

In addition to the funding advantage, other dimensions of deposit insurance allow a gross subsidy to accrue to insured depository institutions. This is because deposit insurance differs from market-provided insurance in two important ways. First, the premium is not set by the market. As we discuss below, it is very difficult to measure what a market rate for deposit insurance should be. Second, there are two parts to deposit insurance: the insurance funds administered by the

<sup>2</sup> One example of an implicit government guarantee is the so-called too-big-to-fail policy, under which it is believed that the government would protect extremely large money-center banks from failure in order to maintain the stability of the U.S. financial system.

Federal Deposit Insurance Corporation (FDIC),<sup>3</sup> and a call on the “full faith and credit” of the U.S. government. This call is similar to a standby letter of credit provided by the government. There has never been an explicit charge for this call. But measuring the value of this call is also quite difficult, since the call is “in the money” only if one of the insurance funds becomes insolvent. Hence its value varies over time with the health of the banking industry and the strength of the insurance funds. In the more than 60-year history of deposit insurance, reliance on the “full faith and credit” of the U.S. Treasury has been necessary only once—to clean up the savings-and-loan (S&L) debacle of the 1980s.<sup>4</sup> Nevertheless, the fact that credit from the U.S. government is available for deposit insurance purposes enables insured institutions to borrow in the marketplace at lower interest rates than uninsured financial institutions.

**The Discount Window.** The Federal Reserve’s discount window provides credit to solvent but illiquid banks. Although discount window loans must be fully collateralized, the window’s existence in periods when other sources of credit may not be available under any terms means this backup source of credit provides a subsidy to depository institutions. Moreover, a depository institution does not have to borrow from the window to derive some benefit from its existence. Because of the discount window, banks may be able to fund riskier and less-liquid asset portfolios at a lower cost and on a much larger scale than would otherwise be possible. As with deposit insurance, the subsidy provided by access to the discount window is extremely hard to quantify because the value varies with the health of individual institutions and of the banking industry.

**Access to Payments System.** The Federal Reserve District Banks operate Fedwire, through which banks and thrifts with reserve or clearing accounts at a Federal Reserve Bank may transfer balances to other institutions that have similar accounts. For many institutions, payments made on a given day may exceed that day’s opening balance; when a bank’s account goes into a negative position, a daylight overdraft occurs. Because Fedwire transfers are “guaranteed” by the Federal Reserve at the time they are initiated, the Federal Reserve assumes the intra-day credit risk that a participating bank will not have enough funds at the end of the day to discharge its obligations. When banks that incur intra-day overdrafts do not pay a market rate for the Fed’s overdraft protection, the differ-

ence between the market rate and the Fedwire rate represents a government-provided financial subsidy. Again, determining what the market rate for such overdraft protection would be is difficult, but many contend that the current rate charged banks for use of Fedwire is less than the rate a private provider would impose.

### *Legislative, Regulatory, and Market Developments Affecting the Size of the Gross Subsidy*

Although the federal safety net continues to provide banks with a gross subsidy, the subsidy has been lessened considerably in the past decade by a number of statutory and regulatory changes designed specifically to reduce the safety net–related advantages that had been accruing to insured depository institutions.

**Capital Regulation.** Bank capital serves as a cushion to absorb unanticipated losses and shrinkages in asset values that could otherwise cause a bank to fail. Capital levels can be likened to a deductible for federal deposit insurance. As such, the higher the level of capital, the lower the “market” rate for deposit insurance. In addition, all other things being equal, the higher a bank’s capital level, the greater its creditworthiness. Thus, higher capital levels imply a lower *gross subsidy* from the discount window and Fedwire.

In 1988, the major industrialized nations, concerned about declining levels of bank capital, adopted uniform standards for capital adequacy. The Basle Accord established an international capital measure (total capital to risk-weighted assets) and set 8 percent as the minimum acceptable level of risk-based capital. Adoption of minimum capital standards and of capital requirements tied to the risk profiles of banks has resulted in banks holding more capital and has moved industry

<sup>3</sup> These include the Bank Insurance Fund (BIF) and the Savings Association Insurance Fund (SAIF), both of which are maintained by premiums assessed on insured banks and savings associations. Both funds are currently fully capitalized and exceed the statutorily mandated level of \$1.25 per \$100 of insured deposits.

<sup>4</sup> Total taxpayer cost for resolution of the S&L crisis has been estimated at approximately \$126 billion, excluding interest on the national debt. In contrast, the commercial banking industry has never had to exercise its call on the U.S. Treasury. Although the FDIC borrowed working capital from the Federal Financing Bank in 1991, it used deposit insurance funds to resolve bank failures and repaid the Treasury borrowings in 1993 with interest. Thus, there was no net cost to the U.S. taxpayer for deposit insurance for commercial banks insured by the FDIC.

capital levels closer to the levels the market might impose in the absence of the federal safety net. Capital regulation, therefore, has significantly reduced the subsidy from the safety net.

**Prompt Corrective Action.** In 1991, Congress passed the Federal Deposit Insurance Corporation Improvement Act (FDICIA) that, among other things, included provisions designed to limit regulatory forbearance by requiring more-timely and less-discretionary intervention, with the objective of reducing failure costs. Under these Prompt Corrective Action (PCA) provisions, as an institution's capital position declines, the appropriate bank regulator is required to increase the severity of its actions. These actions range from restricting asset growth (for undercapitalized institutions) to closing banks (those that are critically undercapitalized for a prescribed period).<sup>5</sup> Since PCA requires regulatory action while an institution still has some tangible capital remaining, in theory the deposit insurance funds are less likely to suffer large losses should an institution eventually fail. Moreover, the value of the "call" on the full faith and credit of the U.S. Treasury is reduced.

**The Least-Cost Test.** FDICIA also instituted the "least-cost test." With rare exceptions, the FDIC may meet its insurance obligations by means other than a payoff only if the other method is deemed "least costly" to the deposit insurance funds. Before this requirement, the FDIC could choose any method that was cheaper than the estimated cost of liquidation; most institutions with over \$100 million in assets were resolved through a purchase-and-assumption transaction in which all liabilities except subordinated debt were assumed by an acquirer. The least-cost test caused the FDIC to change the way it structured resolutions, so that uninsured depositors or other general creditors often suffer losses in a resolution.

In the five years leading to the enactment of FDICIA (1987–1991), uninsured depositors and other general creditors suffered losses in only 17 percent of the 927 bank failures. From the enactment of FDICIA through 1998, the comparable figure has been 63 percent (of 191 bank failures). With the least-cost test requiring uninsured depositors and other general creditors to bear greater risk, the resultant market discipline serves to reduce the subsidy from the safety net.

**Risk-Based Deposit Insurance.** FDICIA also required the FDIC to develop and implement a system

of risk-based deposit insurance premiums. Since the market rate for insurance is related directly to the amount of risk an institution takes, flat-rate insurance provided the greatest subsidy to the riskiest institutions. The aim of risk-based premiums is to make the price of insurance a function of an institution's portfolio risk, thus not only reducing the subsidy to risk taking but also spreading the cost of insurance more fairly across depository institutions. Though the magnitude of the subsidy's reduction is not easily quantifiable, risk-based insurance premiums should have reduced the size of the *gross subsidy* accruing to depository institutions because of fixed and often underpriced deposit insurance.

**National Depositor Preference.** In 1993, as part of the Omnibus Budget Reconciliation Act, Congress passed a national depositor preference statute that changed the priority of claims on failed depository institutions.<sup>6</sup> Under depositor preference, a failed bank's depositors, and by implication the FDIC, have priority over the claims of general creditors. In theory, depositor preference would reduce losses to the insurance fund from bank failures by increasing the value of the FDIC's claims and reducing the average cost of resolutions. Moreover, since the claims of general creditors are now subordinated to those of insured depositors and the FDIC, it is anticipated that these groups will demand higher interest rates on their funds, more collateral, or both, to compensate for their increased risk of loss—effectively raising a bank's overall cost of funds and lowering the *gross subsidy* associated with underpriced deposit insurance and the federal guarantee.

**Changes to Discount Window Policy.** To enhance market and regulatory discipline in the banking sector and to protect the deposit insurance funds, FDICIA also restricted the ability of the Federal Reserve to lend to undercapitalized institutions through the discount window. In particular, FDICIA restrained the Federal Reserve from lending to institu-

<sup>5</sup> Critically undercapitalized institutions are those with tangible capital ratios of 2 percent or less. Under FDICIA, a receiver must be appointed for any institution that is critically undercapitalized for 90 days, although an extension is possible to 270 days if the regulator and the FDIC concur and document why the extension would better serve the purposes of the provision.

<sup>6</sup> Public Law 103-66, Title III, instituted national depositor preference for all insured depository institutions by amending Section 11 (d)(11) of the Federal Deposit Insurance Act.

tions that fall below minimum capital standards, setting time periods beyond which the Federal Reserve may not lend to undercapitalized institutions without incurring a potential limited liability to the FDIC. The liability is incurred if an undercapitalized institution borrows for more than 60 days in any 120-day period. Because undercapitalized institutions have the most difficulty obtaining credit at attractive rates elsewhere and thus benefit most from access to the discount window, restricting their access to the discount window reduces the *gross subsidy* that flows from such access.

**Changes to Payments System Policies.** Two changes to payments system policies have reduced the subsidy arising from the Federal Reserve's guarantee of transactions on Fedwire. First, in 1988, the Federal Reserve instituted a system of net debit caps (credit limits) on an institution's daily Fedwire overdrafts. Then in April 1994 the Federal Reserve started charging fees for daylight overdrafts incurred in accounts at Federal Reserve Banks. Since April 1995 the fee has been set at an annual rate of 15 basis points of chargeable daily overdrafts. (A chargeable overdraft is an institution's average per-minute daylight overdraft for a given day, less a deductible amount equal to 10 percent of its risk-based capital.) From April 1995 through December 1995, overdraft charges averaged \$27 million at an annual rate. During that period, approximately 120 institutions incurred fees regularly, with the largest banks (those with assets of more than \$10 billion) accounting for, on average, 92 percent of total charges.<sup>7</sup> The debt limits and daylight overdraft fees together led to a dramatic decline in total daylight overdrafts—averaging 40 percent in the six months following the initial imposition of fees in April 1994. This reduction in daylight overdrafts has reduced the Federal Reserve's intra-day credit risk and its liability as guarantor of all Fedwire transactions and has thus reduced the subsidy accruing from the government-operated payments system. In addition, technological changes that are rapidly transforming the payments system—changes such as real-time settlement and alternative means for settling payments—are likely to erode the subsidy still more.

In summary, although banks still receive a *gross subsidy* from the safety net, statutory and regulatory changes have reduced it significantly during the past decade.

## *Gross Subsidy, Net Subsidy, and Net Marginal Subsidy*

The federal safety net for banking, besides extending certain benefits (including a *gross subsidy* in the form of a funding advantage), also imposes direct and indirect costs. The current system of regulation and supervision of the banking industry, for example, has arisen in part because of the externalities created by the intrusion of government into the financial marketplace. In addition, the banking industry has been restrained from engaging in certain potentially profitable activities because they were deemed too risky, while simultaneously it has been forced to pursue other endeavors in the interest of societal goals. Therefore, in examining the question of whether a subsidy exists and, if so, whether it can be transferred beyond the core bank, one must recognize that the relevant question is not whether a *gross subsidy* exists, but whether a *net subsidy* remains after all the offsetting costs, both explicit and implicit, are taken into account.

In some instances, moreover, it is critical to determine whether a net subsidy exists at the margin. That is, do the benefits of adding an additional dollar of deposits exceed the costs? In the case of deposit insurance, for example, if the benefit (subsidy) from each additional dollar of insured deposits exceeds the costs, then an institution will have an incentive to increase its use of deposits in order to maximize the deposit insurance subsidy. However, if the benefit from each additional dollar of deposits is offset—say, by regulatory costs that are linked directly to the level of insured deposits—then the marginal subsidy is reduced or eliminated. As the *net marginal subsidy* approaches zero, a bank's choice of funding will increasingly depend on the relative costs of funds as determined in the market, as is the case for uninsured financial firms. In practice, some regulatory costs are indeed tied directly to the level of deposits and thus serve to reduce the gross subsidy at the margin. Among these offsetting marginal costs are deposit insurance premiums, payments to the Financing Corporation (FICO), and reserve requirements.

<sup>7</sup> See Richards (1995).

### *Measuring the Gross Subsidy*

The first step in answering the question of whether a net subsidy exists is to measure the magnitude of the gross subsidy. But doing so is quite difficult, and few estimates exist. Those few, however, suggest that it is not large.

One method of measuring the gross subsidy from the safety net—or at least from the deposit insurance portion of it—is to estimate the market rate for deposit insurance. Unfortunately, calculating what that rate should be is very hard to do. The bulk of the studies that estimate a market rate for deposit insurance have applied an option-pricing model to deposit insurance data from the 1980s.<sup>8</sup> The rationale for applying this model to deposit insurance is that if a bank is found to be insolvent, depositors can, in effect, “sell” their share of the bank’s liabilities to the FDIC in exchange for cash. Thus, the value of this option to sell would be the appropriate price for insurance. If insurance premiums are set lower than the option price, the bank can be said to receive a subsidy.

Unfortunately, using option-pricing theory as a basis for valuing deposit insurance involves numerous methodological problems. Most notably, option theory deals with finite time contracts, contracts that expire in a year or at the end of some other finite period of time, whereas the deposit insurance guarantee is theoretically open-ended. In addition, the value of insurance as calculated by these models also depends critically on (1) the timing of bank examinations (greater frequency of examinations lowers the risks to the insurance funds and therefore lowers the value of insurance), (2) the actual recovery on the assets of the failed bank, and (3) the actual or assumed degree of regulatory forbearance. Hence, as computed by these models, the estimated fair value of deposit insurance varies widely depending on the model’s assumptions.

Given these caveats, most option-based models estimated that for the majority of banks, the fair value of deposit insurance in the 1980s was less than the explicit insurance premium applicable at that time—implying a negative deposit insurance subsidy. Only for the weakest banks were estimated deposit insurance values found to be above the premium rate charged by the FDIC (8.3 cents per \$100 for most of the 1980s).<sup>9</sup>

The widespread finding that most banks received only a minimal gross subsidy from deposit insurance in the 1980s has recently been corroborated by Whalen (1997), who estimated fair deposit insurance premiums

for the 50 largest domestically owned bank holding companies for 1996. Like the authors of many of the earlier studies that used option-pricing models, Whalen found the estimates of the value of deposit insurance to be highly sensitive to the assumed values of key explanatory variables. For example, the mean value of the estimated fair premia is only 1 basis point when depository institutions are assumed to be closed at the time the market value of their assets is 95 percent of the value of their liabilities, and 30 basis points when the closure threshold is allowed to slip to 90 percent (that is, when the market value of their assets is 90 percent of the market value of their liabilities). But, consistent with the findings of earlier studies, Whalen also found the estimated premia values to be highly skewed, with the median value significantly less than the mean. For example, assuming a closure threshold of 90 percent, the median deposit insurance value for the sample was roughly 4 basis points, while the mean was 30 basis points. In this scenario, almost 80 percent of the sample banks had estimated fair premia below the mean value, suggesting that the median rather than the mean value is a better indicator of the fair premium for a “typical” bank. Median (as well as mean) values for closure thresholds above 90 percent are extremely small, suggesting that the typical bank in the sample received only a small gross subsidy from deposit insurance.

Another measure of the gross subsidy from the safety net was noted by Federal Reserve Board Chairman Alan Greenspan in testimony before the House Banking Committee in February 1997. In his remarks, Greenspan observed that the debt of a bank holding company generally has a lower credit rating than comparable debt of the holding company’s lead bank, and suggested that the resultant difference in bond yields may offer one measure of the subsidy from the safety net.<sup>10</sup> According to data collected by the Federal Reserve, in 1990 this difference was 10 to 15 basis

<sup>8</sup> The connection between option pricing and deposit insurance was first noted by Merton (1977). For empirical estimates of the fair value of deposit insurance, see, for example, Flood (1990), Marcus and Shaked (1984), McCulloch (1985), Ronn and Verma (1986), Pennacchi (1987), Kuester and O’Brien (1990), Epps, Pulley, and Humphrey (1996), and Whalen (1997).

<sup>9</sup> However, it should be noted that, on average, the premium rates estimated in most of the studies employing option-pricing models would have been grossly insufficient to cover FDIC losses during the 1980s and early 1990s.

<sup>10</sup> See Greenspan (1997), 3.



points, but since 1994 it has been in the 4 to 7 basis point range. Moreover, Greenspan asserted, this ratings differential could also be considered evidence that the safety net provides the bank with a funding subsidy that is not transferred to the bank's parent holding company. Because it allegedly shows that the holding company structure is more effective than a bank subsidiary structure in limiting the advantages of the safety net, this assertion is considered particularly important evidence by those who favor mandating the bank holding company structure in proposed financial modernization legislation.

In interpreting the data Greenspan alluded to, one must remember two things. First, the ratings differential captures only the difference between the bank and its holding company. If the holding company's debt rating is enhanced by the safety net, then the ratings differential would underestimate the magnitude of the gross subsidy. Second, besides the safety net, other very good reasons exist for the ratings differential between the bank and its holding company. Indeed, it is not clear that the safety net plays a significant role in the 4 to 7 basis point discrepancy between the cost of bank debt and the cost of bank holding company debt. In fact, both Moody's and Standard and Poor's credit rating manuals cite the priority structure in debt servicing and in bankruptcy as the primary reason that bank debt typically carries a higher credit rating than BHC debt. In most bank holding companies, for example, the subsidiary bank is the primary operating unit that generates debt service payments. But in times of stress, banking regulators can restrict a bank's ability to pay dividends to its holding company—thereby endangering the holding company's source of funds to service its debt. Furthermore, during periods of financial distress or adversity federal regulators may even be able to require a bank holding company to use its available resources to provide adequate capital funds to its subsidiary bank(s).

In any event, under no circumstances can the entire ratings discrepancy be attributed to the safety net. This is an important point. It means that when the nondeposit funding costs of banks and bank holding companies are compared, any subsidy-related difference is less than 4 to 7 basis points even before offsetting costs are taken into account.

### *Offsets to the Gross Subsidy*

As just discussed, estimating the size of the gross subsidy is hard to do, and no good estimates exist. After careful evaluation, however, one can reasonably assume that for well-capitalized banks under all but the most severe economic conditions, the gross subsidy derived from the three components of the safety net is not particularly large—perhaps only a few basis points. But whatever its magnitude, the gross subsidy is at least partly offset by both direct and indirect costs. These include deposit insurance premiums, interest payments on bonds issued by the FICO, reserve requirements, regulatory-burden expenses, and operational costs associated with collecting deposits.

**Risk-Based Deposit Insurance Premiums.** The fair value of deposit insurance, as estimated by option-pricing models, is not a measure of the subsidy from deposit insurance, because banks pay premiums for the insurance. Historically, all banks paid a flat rate. Between 1935 and 1988 this rate was never more than 8.3 basis points per dollar of insured deposits (or 8.3 cents per \$100). Beginning in 1989, the FDIC began to raise rates.<sup>11</sup> From 1990 through 1996, banks and thrifts paid higher premiums to recapitalize the insurance funds, with the premium assessment ranging as high as 31 basis points for some institutions. In 1990, the assessment rate was increased from 8.33 basis points to 12 basis points; in 1991, to 19.5 basis points for the first six months and to 23 basis points for the second six months. Until the two funds reached full capitalization at 1.25 percent of total estimated insured deposits (May 1995 for the BIF, late 1996 for the SAIF), assessment rates for insured institutions were kept within the range of 23 to 31 basis points. Effective January 1, 1996, insurance premiums for BIF-insured

<sup>11</sup> The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) granted the FDIC limited authority to increase assessment rates as needed to protect the insurance funds, and specified certain flat annual assessment rates that were to be in effect for each of the two deposit insurance funds through 1991. In 1990, the FDIC Assessment Rate Act introduced greater flexibility in the timing and amount of assessment rates. FDICIA (1991) fundamentally changed the assessment process by (among other things) establishing a system of risk-based deposit insurance premiums and requiring that rates be set semiannually to maintain a fund reserve ratio of at least 1.25 percent. The current system of risk-based premiums became effective on January 1, 1994.

institutions were lowered to a range of 0 to 27 basis points. For most SAIF-insured institutions, the assessment rate for calendar year 1996 averaged approximately 20.4 basis points. In the third quarter of 1996, SAIF members paid an additional one-time special assessment of almost 65 basis points to capitalize the SAIF. Following full capitalization of the SAIF, premiums paid by SAIF-insured members were reduced to a range similar to the range for premiums paid by BIF-insured members.<sup>12</sup>

Because of the recapitalization of the insurance funds and the current health of the banking industry, approximately 95 percent of BIF-insured depository institutions and 90 percent of SAIF-insured institutions now pay no explicit premium for deposit insurance. However, in general any insured depository institution that does not achieve the highest supervisory and capital ratings still pays an explicit premium for deposit insurance.<sup>13</sup> Even though most banks and thrifts now pay no explicit premium for deposit insurance, it is important to remember that these institutions have the highest supervisory and capital ratings and thus are least likely to receive a material subsidy from deposit insurance and from the discount window. Furthermore, the FDIC Board of Directors can raise the reserve ratio whenever it determines there is significant risk of substantial future losses to the insurance funds. In other words, the Board can reach a higher ratio well in advance of a severe crisis, thereby decreasing the likelihood that the call on the U.S. government will have to be exercised in the future and reducing both the gross and the net subsidy attributable to federal deposit insurance.

**FICO Assessments.** In 1987, Congress created the Financing Corporation (FICO) to sell bonds to raise funds to help resolve the thrift crisis. The interest payment on FICO bonds is \$793 million annually, and the last of the FICO bonds matures in 2019. Beginning in 1997, the annual interest has been paid by all FDIC-insured institutions, not just by SAIF-member savings associations. Because commercial banks share in the benefits of deposit insurance, they were asked also to share the burden of these payments. Thus, banks' payment of this fee is a direct result of their access to the safety net. For the fourth quarter of 1998, the FICO assessments were 5.8 basis points (annualized) for SAIF members and 1.2 basis points for BIF members. Beginning in 2000, all institutions will pay a *pro rata* share for FICO, presently estimated to be 2.2 basis points per dollar of deposits.

**Reserve Requirements.** Under current regulations, all depository institutions—commercial banks, savings banks, thrift institutions, credit unions, agencies and branches of foreign banks, and Edge Act corporations—are required to hold reserves against transaction accounts (see table 1). These noninterest-bearing reserves must be held either as vault cash or as a deposit at a Federal Reserve District Bank. Although most institutions are able to satisfy their entire reserve requirement with vault cash (which they would probably hold in any case to meet the liquidity needs of their customers), approximately 3,000 larger depository institutions also maintain deposits, called *required reserve deposits*, at a Federal Reserve District Bank.<sup>14</sup>

Table 1  
**Reserve Requirements of  
Depository Institutions, 1998**

Amount of Net Transaction Accounts	Requirement (percent)
\$0 million-\$47.8 million	3
More than \$47.8 million	10
Nonpersonal time deposits	0

Since reserves are required only on transaction accounts, that is, only on specific types of deposits, it is possible to calculate the marginal cost associated with each additional dollar deposited in a reservable account. One can compute the marginal cost of the reserve requirement by multiplying the required reserve ratio (3 percent or 10 percent) by the opportunity cost of idle balances (assumed to be 5 percent—the federal funds rate through most of 1998). This calculation produces a pre-tax marginal cost of 15 basis points for these deposit balances up to \$47.8 million, and 50 basis points for each dollar of deposits above \$47.8 million. If one assumed a reinvestment rate higher than the federal funds rate, the opportunity cost of reservable funds would be even higher.

<sup>12</sup> As of December 31, 1998, the BIF balance was \$29.6 billion and the SAIF balance was \$9.8 billion. These amounts represented 1.38 percent and 1.36 percent, respectively, of all insured deposits.

<sup>13</sup> For current rate schedules and a risk distribution of insured institutions, see Federal Deposit Insurance Corporation (1998).

<sup>14</sup> See Feinman (1993).

In recent years, the burden of this “reserve tax” has led many depositories to expend resources developing new financial products whose sole purpose is to deliver transaction services without creating reservable liabilities. Depositories have been quite successful at this, and the required reserve balances at Federal Reserve District Banks have dropped considerably. Nevertheless, managing account balances to avoid the reserve tax incurs its own costs and leads to a less than optimal allocation of a bank’s resources.

**Regulatory Burden.** Perhaps the greatest offset to the gross subsidy banks receive from the safety net is regulatory costs. Unfortunately, good estimates of the full cost of the regulatory burden do not exist. A 1992 Federal Financial Institutions Examination Council (FFIEC) study reviewed the literature on regulatory burden and found that “despite differences in methodology and coverage, findings are reasonably consistent: regulatory cost may be 6–14 percent of noninterest expenses, not including any measurement of the opportunity cost of required reserves.”<sup>15</sup> These estimates are for the period before the 1991 passage of FDICIA and therefore do not take into account the regulatory burden imposed by many of the market-oriented reforms of the 1990s, including risk-based capital requirements and risk-based deposit insurance premiums. Nor do the estimates include the additional costs associated with performance-based revisions to the Community Reinvestment Act or stricter application of the fair lending laws. Nevertheless, even the low end of the FFIEC range—6 percent—still yields substantial regulatory costs. For example, 6 percent of the approximately \$186 billion of noninterest expenses incurred by FDIC-insured institutions during 1996 yields an estimated \$11 billion in regulatory costs. Expressed in terms of average total deposits at FDIC-insured institutions during 1996 of more than \$3.8 trillion, this amounts to roughly 29 basis points (or 29 cents per \$100 of deposits).

To be sure, not all of these costs are marginal costs, but neither are all of them fixed costs. Many regulatory costs might best be characterized as “lumpy”—that is, although they do not increase with each dollar of new liabilities, they do increase with bank size. Thus a bank could not use bank borrowings to finance a significant new activity in either an operating subsidiary or a holding company affiliate without incurring additional regulatory costs.

**Costs of Raising Retail Deposits.** It is also important to remember that collecting retail deposits is

not costless. In contrast to nonbank financial companies that obtain funds through the capital markets, commercial banks and thrifts generally must support an extensive network of branch banks and offer numerous services to customers in order to obtain and retain insured deposits. Consequently, the “subsidized” marginal cost of deposits is not as low, relative to a nonbank financial firm’s market cost of funds, as some might think. Passmore (1992), for example, found that the “all-in” costs of collecting retail deposits were roughly 47 basis points above the three-month Treasury bill rate.<sup>16</sup> Hence, assuming the accuracy of his data, even at the margin one finds significant offsetting costs to the safety net–related gross funding advantages.

### *Measuring the Net Subsidy and the Net Marginal Subsidy*

Measuring whether banks receive a *net subsidy* requires reliable estimates of the gross subsidy and the offsetting costs, and both of these are hard to determine. Moreover, most economists agree that the value of the subsidy—net, gross, or marginal—varies over time and from bank to bank. Riskier banks clearly receive a larger subsidy than safer banks, while across the industry the value of the subsidy rises and falls countercyclically with the financial business cycle. Nonetheless, with most estimates putting the gross subsidy attributable to deposit insurance at only a few basis points for all but the weakest of banks, the average regulatory costs alone would appear to outweigh this portion of the subsidy significantly. Even if the contributions of the other two components of the federal safety net were quantifiable and could be added to the gross subsidy from deposit insurance, for most banks it is not at all certain that the monetary benefits would exceed the costs.<sup>17</sup>

<sup>15</sup> Federal Financial Institutions Examination Council (1992).

<sup>16</sup> Included in Passmore’s estimated “all-in” cost of retail deposit funding were interest and noninterest expenses, deposit insurance premiums, and the opportunity cost of reserve requirements. His estimate of the cost of retail funds is slightly below the estimates of other, earlier researchers, who put the cost in the range of 50 to 159 basis points above Treasury rates. See Passmore (1992) for a survey of these other studies.

<sup>17</sup> Our conclusion that the net subsidy is small for most banks is supported by the recent work of Whalen (1997). Using a standard option-pricing approach, a conservative set of assumptions, and current data (including a value of zero for the explicit deposit insurance premium), he found that for the 50 largest domestically owned bank holding companies in the United States in 1996, the net subsidy associated with the deposit insurance portion of the federal safety net was minimal or negative.

In determining whether banks receive a net subsidy, some economists have correctly emphasized the importance of *marginal costs*. This is because it is marginal benefits and costs that are relevant for a bank's profit-maximizing calculations and for an understanding of how a bank might be able to exploit any safety-net subsidy.<sup>18</sup> Even at the margin, however, the gross subsidy derived from the safety net appears to be significantly reduced by costs that are directly related to an institution's level of deposits. Deposit insurance premiums (still assessed on "risky" banks), FICO payments, and reserve requirements, for example, are all assessed directly on deposits. Although most banks and thrifts currently pay no explicit deposit insurance premiums, FICO payments are estimated to cost banks and thrifts 1.2 and 5.8 basis points per dollar of deposits, respectively; and on some reservable balances, the marginal cost of reserve requirements can be as high as 50 basis points. Additionally, some regulatory costs can be deemed to vary on the margin. Examination costs, for example, are often considered a fixed cost, but in fact they may be "lumpy" and vary depending on such things as bank size.

### *Evidence of a Net Marginal Subsidy*

Given the difficulty of obtaining reliable estimates of a net subsidy, it is helpful to look at other indicators that might aid us in determining whether banks receive a safety net–related net marginal funding subsidy that affects the business judgments they make. Theoretically one could argue, for example, that the gross subsidy must be offset at the margin, for otherwise the competitive advantage it provided would allow banks to gain an ever-increasing share of financial assets, but that is not happening. In a 1994 study, Boyd and Gertler found, after correcting for a number of measurement issues, that commercial banks' share of total financial intermediation in the United States has been roughly stable over the last four decades, even though financial sector activity has been growing steadily relative to GDP. This finding, plus similar findings by Kaufman and Mote (1994), is not consistent with the argument that banks have enjoyed a meaningful competitive advantage because of safety-net subsidies.

It is also informative to consider how a banking organization would best fund and organize itself to exploit a net marginal subsidy if one existed. If, for example, a deposit insurance subsidy were important, one would expect banks to exploit it by using insured deposits as their primary source of funds. However,

bank financial data indicate that depository institutions are relying less on insured deposits and more on uninsured deposits and nondeposit funding. In fact, for all FDIC-insured institutions, insured deposits now represent less than half of all liabilities, compared with 60 percent in the early 1990s. In 1997, only 45 percent of commercial bank assets were supported by insured deposits, and currently a significant number of banks hardly use them at all. This is especially true of the largest banks, those most likely to engage in nonbanking activities and where one would suspect that the greatest potential for exploitation of any net marginal subsidy would exist. Commercial banks with assets greater than \$1 billion, for example, fund on average only approximately 38 percent of their liabilities with insured deposits.

Furthermore, as Acting Comptroller of the Currency Julie Williams observed, if banks enjoyed a lower cost of funds in the capital markets because of safety net–related benefits, one would expect banking organizations to issue debt exclusively at the bank level.<sup>19</sup> Instead, it is quite common for banking organizations to issue debt at all levels of the organization, including the lead bank and the bank holding company parent. This is not what one would expect if an exploitable funding advantage existed at the bank level.

Nor do banks seem to organize themselves as if a safety net–related net marginal subsidy were important. As Federal Reserve Board Chairman Greenspan explained in recent testimony before the House Subcommittee on Financial Institutions, "One would expect that a rational banking organization would, as much as possible, shift its nonbank activity from the bank holding company structure to the bank subsidiary structure. Such a shift from affiliates to bank subsidiaries would increase the subsidy and the competitive advantage of the entire banking organization relative to its nonbank competitors."<sup>20</sup> Yet, in the real world, banks can be observed using holding company affiliates to engage in a wide range of activities, even though these units are subject to firewalls and other regulatory restrictions that could have been avoided if the activity were conducted through the bank or in a bank subsidiary. As of September 30, 1996, the 50 largest bank holding companies had 155 mortgage

<sup>18</sup> See, for example, Kwast and Passmore (1997).

<sup>19</sup> See Williams (1998), 10, A22.

<sup>20</sup> See Greenspan (1997), 3–4.

banking affiliates, 98 commercial finance affiliates, and 263 consumer finance affiliates. At the same time, the bank subsidiaries of these holding companies had 104 mortgage banking subsidiaries, 24 commercial finance subsidiaries, and 89 consumer finance subsidiaries. In addition, the banks conducted mortgage, commercial, and consumer finance activities directly through the bank—and, moreover, were empowered to do so nationwide.<sup>21</sup>

Following the logic that a rational banking organization would choose its funding and organizational structure so as to maximize its competitive advantage from the subsidy, one sees only three possibilities: (1) the subsidy is the same whether an activity is conducted in a holding company affiliate or in the bank proper, (2) there is no net subsidy, marginal or otherwise, or (3) the net marginal subsidy is so small that other considerations outweigh it. Because Sections 23A and 23B of the Federal Reserve Act make the first possibility highly unlikely, the fact that banking organizations choose all three forms of organization—holding company affiliate, bank subsidiary, and bank proper—suggests that there is not a net marginal funding subsidy, or that if one exists, it is so small as to be outweighed by other considerations.<sup>22</sup>

Although we believe our observations make a strong case for concluding that no significant net marginal subsidy exists, we recognize that Federal Reserve officials and staff have consistently offered alternative evidence which they argue supports their position that a net marginal subsidy does exist and is large enough to influence behavior. As evidence of the subsidy advantage, for example, Kwast and Passmore (1997) point out that (1) banks have historically had lower leverage ratios (equity-to-asset ratios) than their nonbank competitors, and (2) according to their analysis, there has been a trend among bank holding companies toward shifting assets and activities that could be conducted in banks from BHC subsidiaries back into the bank proper.

The first argument, that banks hold proportionally less capital than competing nonbank financial institutions, is not persuasive evidence of a safety-net subsidy for several reasons. As others have pointed out, it is problematic to make comparisons of capital ratios in different industries in isolation from the industries' relative risk profiles. Markets permit firms with lower risk to hold less capital. So lower capital ratios at banks could simply reflect an overall lower degree of risk in banking than in securities underwriting, for example. In addition, as Kaufman (1994) has suggested, the low-

er capital ratios maintained by banks could partly result from the relatively more efficient resolution process in banking and the consequently smaller losses suffered by bank creditors compared with creditors of nonbank firms. Finally, the fact that banks operated with substantially lower capital ratios than nonbank firms even before deposit insurance was introduced (in 1933) suggests that the existence of the federal safety net is not what underlies the banking industry's ability to operate with lower equity-to-asset ratios than other industries.

The second argument put forward by Kwast and Passmore (1997) as evidence of a net marginal subsidy is a reported decline over the period 1986–1996 in the share of total BHC assets in nonbank subsidiaries that are engaged in selected activities that can be conducted in both a bank and a BHC subsidiary.<sup>23</sup> According to their data, the percentage of assets in the included activities in BHC subsidiaries fell from approximately 3.8 percent in 1986–1988 to approximately 1.8 percent in 1993–1994. This trend, the authors contend, is evidence that BHCs have been shifting these assets into the bank proper in order to take advantage of a safety-net subsidy. However, there are at least two major problems with their analysis.

First, because of inconsistencies in the data over the period studied, it is not clear that such a shift has actually occurred. As Acting Comptroller of the Currency Williams testified before the U.S. Senate Banking Committee, “Between 1994 and 1995 the Federal Reserve changed the instructions governing the filing of the asset data used in the calculation of the reported shift to reduce, if not eliminate, apparently widespread, year-by-year, reporting errors.”<sup>24</sup> Such data errors and the changes made in the reporting instructions certainly call into question the validity of any trend analysis for the period discussed.

Second, even if the share of BHC assets held in nonbank financial subsidiaries did decline over the period discussed, there is nothing to indicate that the assets were necessarily shifted into the bank proper or to direct bank subsidiaries. Indeed, a number of other explanations besides a safety net–related subsidy are

<sup>21</sup> See Helfer (1997).

<sup>22</sup> The observed choices of organizational structure, for example, could partly reflect the effect of the geographic restrictions that existed until passage of interstate banking in 1994.

<sup>23</sup> Kwast and Passmore (1997) examined nonbank subsidiaries engaged in commercial finance, mortgage banking, consumer finance, leasing, data processing, and insurance agency.

<sup>24</sup> See Williams (1998), 11.

possible for the observed differences over time in the percentage of BHC assets devoted to the selected activities. For example, the 1980s saw an unprecedented wave of innovations in the nation's financial markets. In particular, the development of both securitization techniques and a functioning secondary market for many types of loans fundamentally changed how many mortgage, consumer, and business finance subsidiaries operate. By selling mortgages and other loans into the secondary market, finance companies could increase their lending volumes and earnings while holding fewer assets in portfolio. Hence a decline in the ratio of BHC assets in nonbank subsidiaries engaged in the selected activities to total BHC assets may reflect nothing more than developments in the financial markets and related changes in the operations of nonbank financial subsidiaries.

Data from the FR-Y11AS reports<sup>25</sup> also suggest that BHCs may have simply reallocated assets from subsidiaries engaged in the more traditional nonbank activities examined by Kwast and Passmore to subsidiaries engaged in relatively more profitable nonbank activities, such as securities brokerage and securities and insurance underwriting. Assets of subsidiaries engaged in securities brokerage and underwriting, for example, grew from \$19 billion in 1986 to \$127 billion in 1994—an increase of 541 percent. BHC assets invested in insurance underwriting subsidiaries and small business investment companies also increased dramatically during the period, rising 220 percent and 1,450 percent, respectively. Indeed, the reallocation of assets during this period is startling. In 1986, nonbank subsidiaries' assets in these three activities accounted for only approximately 13 percent of all assets of nonbank subsidiaries of bank holding companies. By 1994 the comparable figure was nearly four times as much, or 47 percent.

BHCs may have been encouraged to shift assets into securities subsidiaries not only by expectations of higher profits but also by regulatory rules that limit revenues derived from underwriting and dealing in bank “ineligible” securities (such as corporate debt and equity) to a fixed fraction of the gross revenues of the securities subsidiary.<sup>26</sup> Given this restriction, BHCs have an incentive to move additional activities into the securities subsidiary, thereby enlarging the revenue base and allowing more revenue to be generated through the underwriting of “ineligible” securities.

Finally, even if assets were moved from holding company affiliates to the banks and direct bank sub-

sidaries, that is entirely consistent with the gains in efficiency expected after the removal of geographical and other barriers to interstate banking and with a bank's increasing opportunities to offer “one-stop” customer service. In other words, if the shifting of assets as perceived by Kwast and Passmore did take place, it may simply reflect a BHC's desire to reallocate resources to relatively more profitable activities and achieve greater operational efficiencies. In short, it may have nothing to do with capitalizing on a safety-net subsidy.

In summary, the alleged decline in the ratio of assets in selected BHC activities to total BHC assets is based on questionable data, but even if it did take place, there is no reason to believe it was the consequence of BHCs shifting assets into the bank or a direct bank subsidiary in order to take advantage of a net marginal subsidy accruing to the bank.

### *Firewalls and the Transferability of a Net Subsidy*

Despite what we consider to be evidence to the contrary, some policymakers maintain that the safety net–related net marginal subsidy is significant, and have expressed concern that banks could pass a funding advantage on to their bank subsidiaries and affiliates—thereby giving the banking industry an unfair competitive advantage *vis-à-vis* its financial-services competitors and creating an unwarranted extension of the federal safety net. Setting aside the issue of whether a net marginal subsidy exists and, if so, how large it is, we find it instructive to consider the channels through which banks might be able to transfer a subsidy beyond the parent bank. In theory, there are primarily two such channels: a bank could transfer the subsidy through capital infusions to its subsidiary or to an affiliate, or it could transfer the subsidy to a subsidiary or affiliate by extending loans or engaging in the purchase or sale of assets at terms favoring the subsidiary or affiliate. In practice, however, reasonable firewalls—designed to protect insured banks and the

<sup>25</sup> Before being replaced in 1995 by forms FR Y-11Q and FR Y-11I, the FR-Y11AS reports were required to be filed annually by any domestic or foreign-owned bank holding company that operated a subsidiary engaged in a permissible nonbank activity.

<sup>26</sup> From 1987 to 1989, BHC securities subsidiaries were allowed to derive 5 percent of their gross revenues from underwriting and dealing in bank “ineligible” securities. This ratio was raised to 10 percent in 1989 and to 25 percent in 1997.

deposit insurance funds—make the transfer of any subsidy difficult, though not necessarily impossible under all circumstances.<sup>27</sup>

### *Transferring a Subsidy from a Bank to an Operating Subsidiary*

To conceptualize the difficulty of passing a subsidy on to an operating subsidiary, consider that the Comptroller of the Currency's operating subsidiary rule<sup>28</sup> requires that for a bank subsidiary to engage as principal in an activity not permissible to the insured bank, (1) the bank must be "well-capitalized"; (2) the bank's equity investment in the subsidiary must be deducted from regulatory capital (and assets); (3) the subsidiary must not be consolidated with the bank for regulatory capital purposes; and (4) "covered transactions" between the bank and its subsidiary must be subject to restrictions similar to those of Sections 23A and 23B of the Federal Reserve Act. These four requirements make it quite difficult to pass on a net subsidy. For example, requirements (1) and (2) permit only excess capital to be invested as equity in a subsidiary. That is, a bank would need capital beyond the amount the regulators required it to have for its own level of risk assumed. This restriction ensures that even if the total investment in the operating subsidiary were lost, the regulatory capital of the parent bank would not be impaired.<sup>29</sup>

These firewalls are not impenetrable, however. If a bank had excess regulatory capital—capital above the well-capitalized level—it could theoretically pass a portion of any net marginal subsidy to a bank subsidiary by borrowing additional "subsidized" funds at the bank and investing these funds as "equity" in its subsidiary. The bank's consolidated costs of funds would fall because subsidized funds borrowed at the bank would replace unsubsidized liabilities at the subsidiary. The bank could make such an investment even if it had decided for business reasons to hold more capital in the bank than required by regulatory standards, since its consolidated (GAAP) capital level would remain unchanged. However, unless all of the liabilities of a bank subsidiary were replaced with equity investments funded by subsidized bank borrowings, only a portion of a subsidy could be passed to the subsidiary. Since we are talking about a net marginal subsidy that may not exist at all or that, at most, is very small, a portion of it would be a *de minimis* amount.

The second possible channel, in theory, is for a bank to extend a net subsidy to a subsidiary through loans or

other extensions of credit on terms favorable to the subsidiary. However, under the OCC's operating subsidiary rule, a subsidiary that is conducting activities as principal is subject to Sections 23A and 23B of the Federal Reserve Act, which (1) limit extensions of credit to any subsidiary to no more than 10 percent of a bank's capital, (2) require that such extensions be over-collateralized, and (3) require that such extensions be made on an "arm's-length" basis.<sup>30</sup>

### *Transmitting a Subsidy to a BHC Affiliate*

Sections 23A and 23B would also prohibit the *direct* transmission of a net marginal subsidy from a bank to a nonbank affiliate within the same holding company. However, if a bank had excess capital, it could *indirectly* provide "subsidized" funding to a nonbank affiliate within the holding company by borrowing additional subsidized funds and declaring additional dividends payable to the parent holding company. The BHC could then downstream the dividends to another member of the holding company, which could then use those funds to pay off market-rate liabilities. Consequently, the nonbank affiliate's cost of funds and the overall cost of funds of the holding company would decline. However, in this case the bank's consolidated capital ratio would fall. Thus it might hesitate to pay these dividends if it had business reasons to hold additional capital at the bank level. In addition, there are statutory and regulatory impediments to this "upstream" transmission of funds from a bank to its hold-

<sup>27</sup> Firewalls are statutory and regulatory limitations on financial transactions between banks and their affiliates. Firewalls are intended primarily to prevent a banking company from shifting financial losses from its nonbank subsidiary to its insured bank subsidiary and, potentially, to the federal deposit insurance funds. However, firewalls also serve to limit opportunities for the bank to subsidize its nonbank affiliates by making loans at below-market rates or by providing funds or services at terms favorable to such affiliates. For a thorough discussion of firewalls, see Walter (1996).

<sup>28</sup> 12 C.F.R. Part 5.

<sup>29</sup> According to Longstreth and Mattei (1997), this restriction amounts to *preemptive* corrective action whereby the capital necessary to absorb a 100 percent loss of the investment must be in place *before* the subsidiary is established. The corrective mechanism is self-executing and operates without regulatory intervention in the wake of a loss.

<sup>30</sup> See 12 C.F.R. § 5.34(f)(3)(ii).

ing company parent.<sup>31</sup> For example, FDICIA's Prompt Corrective Action provision prohibits the payment of dividends when a bank is deemed undercapitalized or when the payment of the dividend would make the bank undercapitalized. A bank's dividend-paying capacity would be further limited by law and regulation if the dividend payments exceeded a bank's retained earnings for the period or if the total of all dividends declared during the calendar year exceeded the sum of net income plus the retained net income of the prior two calendar years. In contrast to the bank-sub-sidiary model, however, such a transfer could take place even if the bank were not well-capitalized, since there is no requirement that a bank be well-capitalized to pay dividends to its parent holding company. Do BHCs employ this technique to transfer a subsidy to their nonbank affiliates? Unfortunately, despite Greenspan's assertion that they do not,<sup>32</sup> the fungibility of money and the mixing of funds at the holding-company level prevent us from determining whether bank dividends actually do make their way to nonbank affiliates within the holding company.

In summary, although we find it theoretically possible for banks to pass at least a portion of a net marginal subsidy (if one exists) from the bank to either a direct subsidiary or to a holding company affiliate, we also conclude that the firewalls currently in place under *both* organizational models inhibit such transfers. The evidence appears to bear out this conclusion. The FDIC, for example, has allowed securities subsidiaries of state nonmember banks for just over a decade; these bona fide subsidiaries are subject to restrictions to protect the insured bank, much like the firewalls outlined above; and if there were a substantial net marginal subsidy that could be transferred, one would expect at least some large bank holding companies to conduct their securities activities through bona fide subsidiaries rather than through Section 20 subsidiaries of the holding company. One would expect this especially since 1991, when the U.S. Court of Appeals for the Second Circuit ruled that the Federal Reserve Board does not have jurisdiction under the Bank Holding Company Act over bank subsidiaries of a bank in a bank holding company.<sup>33</sup> Yet all large bank holding companies continue to conduct their underwriting activities through bank holding company Section 20 subsidiaries. This fact seems to indicate that if there is a net marginal subsidy, the bona fide subsidiary structure is just as effective as the bank holding company structure in preventing the subsidy's transfer out of the bank.

In times of stress, of course, firewalls tend to weaken, and transgressions have occurred both within and beyond the reach of the regulators. But the FDIC's experience with the financial crises of the 1980s and early 1990s indicates that at such times, pressure can be exerted on a bank by its holding company as well as by subsidiaries. This potential problem is likely to be unaffected by organizational structure.

### *Effect of Organizational Structure on a Subsidy*

To the extent that a net marginal subsidy exists, it is not independent of organizational structure. In particular, the operating subsidy structure may help to contract any net marginal subsidy. If appropriate safeguards are in place, having the earnings from new activities be in bank subsidiaries (where profits accrue to the parent bank) provides the insurance funds with greater protection than they would have under the holding company structure. Moreover, since the fair market price for deposit insurance is tied to expected insurance losses, allowing banks to put new activities in a bank subsidiary and thereby reduce the expected losses of the insurance funds would also lower the fair market price for deposit insurance. It would, as well, lower the value of the banking industry's access to the full faith and credit of the U.S. government. Accordingly, if banks do receive a net marginal subsidy, allowing them to put new activities in bank subsidiaries would lower such a subsidy.

### *Conclusion and Implications for Financial Modernization*

It has long been widely accepted that banks receive a gross subsidy from the federal safety net. As we have shown, however, recent legislative and regulatory changes have significantly constricted the federal safety net and its related gross subsidy. In addition, banks incur costs, both direct and indirect, that appear to largely outweigh any funding advantage derived from

<sup>31</sup> Three major federal statutory limitations govern the payment of dividends by banks (see 12 U.S.C. Sections 1831o, 56, and 60). State law, too, may govern bank dividend payments. See also Federal Reserve Board Policy Statement on Cash Dividend Payments, November 14, 1985.

<sup>32</sup> See Greenspan (1997), 3.

<sup>33</sup> *Citicorp v. Board of Governors of Federal Reserve System*, 936 F.2d 66 (1991).



the safety net. On the basis of the evidence available, we conclude that if banks receive a *net subsidy* at all, it is small. And even at the margin, any subsidy is at least partially offset by regulatory and other costs. Moreover, under the OCC's operating subsidiary rule, the only banks that can use a direct subsidiary to engage in activities not permissible to banks themselves are well-managed and well-capitalized banks—those for which, by definition, any safety net–related subsidy is smallest. Indeed, most evidence suggests that the *net marginal subsidy* received by these banks is insignificant or even negative. Even if a net marginal subsidy did exist, regulatory firewalls (such as those embodied in the OCC's operating subsidiary rule and in Sections 23A and 23B of the Federal Reserve Act) serve to inhibit a bank from passing it either to a direct subsidiary or to an affiliate of the holding company. In both cases, any leakage of a net marginal subsidy out of the insured bank would be *de minimis*.

The true question, then, is whether the theoretical possibility of passing on a net marginal subsidy makes any real-world difference. Is there a reason, for example, to favor one bank organizational structure over the other for the sole purpose of containing a subsidy within the bank? Given the existing firewalls and incentives outlined above, we find no compelling reason to favor the bank holding company model over the bank subsidiary structure or *vice versa*. Notwithstanding Kwast and Passmore (1997), the literature is in almost universal agreement with us on this point. Longstreth and Mattei (1997), Santos (1997), Schull and White (1998), Walter (1998), and Whalen (1997), among others, all conclude that firewalls such as those currently in place inhibit the transfer of any subsidy under both structures. Neither structure has advantages and disadvantages so dominant as to justify the mandating of that organizational form for expanded banking activities.

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# Internal Risk-Management Models as a Basis for Capital Requirements

by Daniel A. Nuxoll\*

In 1988, after extensive negotiation among the G-10 central-bank governors, the Basle Committee on Banking Regulations and Supervisory Practice agreed on uniform capital standards. The agreement, known as the Basle Accord, was an attempt to produce uniform capital standards for internationally active banks.<sup>1</sup> Until then, different countries had set different capital standards for their banks. In some countries, lower standards were thought to give a competitive advantage to banks headquartered in those countries.

Although the focus of the Basle Accord is on uniform capital requirements, the Accord also establishes risk-based capital requirements that supposedly reflect the actual credit risks faced by a bank. The Basle Accord assigns risk weights to all assets, weights that should reflect the relative risks of those assets. For example, commercial and industrial loans have a 100 percent weight, while home mortgages have a 50 percent weight. Weights are also assigned to off-balance-sheet activities, such as loan commitments and standby letters of credit.

Banks are required to hold 8 percent of the risk-weighted assets as capital.<sup>2</sup> This means, for instance, that banks are required to hold 4 percent (= 8 percent x 50 percent) capital for home mortgages, and 8 percent (= 8 percent x 100 percent) capital for commercial and industrial loans.

From the start, however, analysts have repeatedly demonstrated that the risk-based capital requirements do not accurately reflect risk. First, the risk weights

themselves are not accurate: while studies generally indicate that the risk weights are not completely unreasonable, these same studies inevitably find that some category of loan has the wrong weight. Second, loans within a given category are not equally risky—yet a 90-day inventory loan to a profitable company with a solid credit record has the same risk weight as a five-year loan to develop commercial real estate. Third, the requirements ignore risk-reduction activities like diversification and hedging; thus, a portfolio of loans to borrowers in the same industry and the same area (for example, farmers in the same county) has the same capital requirement as a portfolio diversified across industries and regions of the country. Presently, therefore, almost everyone acknowledges that the Basle risk-based capital standards have very little to do with actual risk.

But although the Basle standards fail to reflect accurately the risk in a bank's portfolio, banks do have definite incentives to measure accurately the risk of their activities. In the past decade, banks have developed internal risk-management models to measure their risks systematically. These models are based on the

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<sup>1</sup> U.S. regulators have imposed these requirements on all banks.

<sup>2</sup> The bank also has a 4 percent Tier I capital requirement; Tier I capital is approximately equal to equity. Total capital includes Tier I and Tier II capital; the latter consists of loan-loss reserves and certain forms of nondeposit debt.

best statistical estimates of the particular risks being measured, and most models consider the effects of diversification and hedging. The possibility of replacing the Basle capital standards with these models has been widely discussed.<sup>3</sup>

This article considers three proposals to revise the Basle Accord. The first, which was adopted in 1996, permits banks to use internal models to estimate one kind of risk—the risk of trading activities. The second would permit banks to use somewhat different, but basically fairly similar, models to evaluate the risk of making loans. The third would permit banks to use any method to estimate their own risk, but—in contrast to the current systems—banks that underestimated the risk of their activities would be penalized.

### **Trading-Book Models (Market-Risk Models)**

Regulators had long recognized that the Basle standards for market risk were inadequate, even while banks and securities firms had developed sophisticated methods of measuring the risk of their portfolios. Accordingly, the 1996 amendments to the Basle Accord permitted regulators to accept the calculations of the banks' internal risk-management models in setting capital requirements for the market risk in banks' trading portfolios.

Trading-book models have become increasingly common in banks, especially since 1994, when J. P. Morgan released its RiskMetrics model.<sup>4</sup> J. P. Morgan has distributed this model widely; some components are available over the Internet. Although other risk-management models are available, RiskMetrics has become the standard of comparison, and the other models use very similar methods. Thus, most of the discussion below applies directly to RiskMetrics; nevertheless, it ignores many aspects of this model and focuses on the deficiencies of the simplest configuration of the RiskMetrics models. The discussion also mentions different methods RiskMetrics can use to avoid some of those deficiencies.

Internal risk-management models generally estimate the value at risk; hence they are often called VaR models.<sup>5</sup> The value at risk is the amount of money that would be sufficient to cover most potential losses. Because VaR models focus on risk, they generally ignore profit.<sup>6</sup>

Trading-book VaR models use estimated probabilities of price movements to estimate the probability of losses for the whole portfolio. The data might show, for

example, that over the past 20 years, the price of 10-year Treasury bonds decreased by more than 0.2 percent on only 5 percent of the days. The data might also indicate that the price decreased by more than 0.75 percent on only 1 percent of the days.

Given these data, if a portfolio consists solely of \$100 million of 10-year Treasury bonds, then the VaR model would estimate that losses would exceed \$200,000 (= \$100 million x 0.2 percent) in a day less than 5 percent of the time. This number could be called the 5 percent value at risk because losses would exceed \$200,000 less than 5 percent of the time. The model would forecast that losses would be greater than \$750,000 (= \$100 million x 0.75 percent) less than 1 percent of the time. Similarly, this number could be called the 1 percent value at risk—a bank could be 99 percent certain that this investment would never lose more than \$750,000.

To estimate a Value at Risk model, one needs not only a probability level but also a time horizon. For regulatory purposes, the time horizon is ten trading days and the relevant probability is 1 percent, so the losses within ten days would exceed the value at risk less than 1 percent of the time.

The 1996 Basle amendments require that capital equal three times the value at risk.<sup>7</sup> If the bank's in-

<sup>3</sup> This topic was extensively discussed at a 1998 conference in New York City sponsored by the Federal Reserve Bank of New York, the Bank of England, the Bank of Japan, and the Board of Governors of the Federal Reserve System (Federal Reserve Bank of New York [1998]). In addition, John J. Mingo (1998) has critiqued the current standards and spelled out the benefits of a models approach to bank capital. The International Swaps and Derivatives Association has endorsed an approach that is a definite step toward using internal models to set capital requirements (summarized in Elderfield [1998]).

<sup>4</sup> For the definitive description of RiskMetrics methodology, see Longerstaey and Zangari (1996).

<sup>5</sup> The explanation here of trading-book VaR models applies generally to banking-book VaR models as well, except that the emphasis in the latter is on loans, not securities. Throughout this section, the terms "trading-book model" and "VaR model" are used interchangeably to refer to the trading-book subset of VaR models.

<sup>6</sup> Jorion (1997) discusses VaR models in detail. VaR models are closely related to risk adjusted of return on capital (RAROC) models, originally developed by Bankers Trust; for a summary of Bank of America's RAROC model, see Zaik, Walter, Kelling, and James (1996).

<sup>7</sup> This multiplication factor has been vociferously criticized as arbitrary, usually by banks that want a lower factor. However, the usual rule is that the risk increases with the square root of time because standard deviation increases with the square root of time. Consequently, if the relevant horizon is one year (250 trading days) instead of ten trading days, the multiplication factor should be five. This multiplication factor, too, is undoubtedly incorrect. See Danielsson, Hartmann, and deVries (1998) and Stahl (1997) for opposite sides of the debate. The whole debate demonstrates that no one really knows the "correct" multiplication factor and that the bank regulators have probably been conservative.

ternal model is discovered after-the-fact to have been inadequate, the capital requirement can be increased, reaching a maximum of four times the value at risk. If the performance of the model turns out to have been grossly inadequate, regulators can refuse to use it to set capital requirements.

VaR models can include the effects of both diversification and hedging, which are common methods of controlling risk. Diversification and hedging are possible because prices do not necessarily move together. On the one hand, if prices always moved together, losses from one investment would never be offset by profits from another investment, and neither diversification nor hedging would be possible. On the other hand, if prices always moved in opposite directions, losses from one investment would always be offset by profits from the other, and perfect hedging would be possible. The usual case is that prices sometimes move in opposite directions and sometimes in the same direction, so that losses are sometimes offset by profits from other investments.

The way VaR models incorporate the effects of diversification and hedging is by estimating the correlations between price changes. If two prices always move together, the correlation equals one; if they always move in opposite directions, the correlation is negative one. In fact, securities prices tend to move together, but they do not always move together, so almost all estimated correlations are greater than zero, but less than one. Consequently, diversification generally reduces risk.<sup>8</sup> Importantly, assumptions or estimates of these correlations amount to measurements of the effects of diversification and hedging, and they translate directly into estimates of the riskiness of the portfolio.

The significance of diversification and hedging was evident in the first stages of the thrift crisis (before 1983). Thrifts held a large number of very safe securities, namely fixed-interest-rate mortgages. However, thrifts were not well diversified, because changes in interest rates affect the value of all fixed-rate mortgages. The high interest rates in the late 1970s and early 1980s drove the value of these mortgages down. At the same time, thrifts had to pay higher interest rates to obtain deposits. The result was that many thrifts faced insolvency by 1983.<sup>9</sup> (Of course, the evolution of the thrift crisis after 1983 had little to do with interest rates.)

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Because of the large number of traded securities, trading-book VaR models inevitably use a large number of simplifying assumptions. We now examine five of them, noting any evidence on whether they produce overly large or overly small estimates of value at risk.

The first simplifying assumption VaR models commonly make is that price changes are distributed normally (they make this assumption because the normal distribution is easy to handle mathematically). The actual distribution of price changes and financial data, however, is generally not normal. Specifically, the normal distribution understates the probability of large price changes. VaR models that use the assumption of normality therefore understate the probability of large price declines, thereby understating the probability of large losses.

Many fixes have been suggested to solve this problem, but for regulators the problem is nothing to worry excessively about: VaR models estimate the probability of large losses during a day, whereas regulators are undoubtedly more concerned about the long run. Though the normal distribution might be misleading for managing risk on a daily or weekly basis, in the long run even financial data are distributed normally.<sup>10</sup>

<sup>8</sup> Mathematically, diversification is possible when a correlation is positive and less than one. Hedging is possible when a correlation is negative. Hedging often depends on instruments like futures which permit a trader to sell "short," that is, sell for future delivery at a fixed price. The value of these contracts moves in the opposite direction to the current price. Short selling essentially turns a positive correlation into a negative correlation. Most descriptions of hedging assume that the correlation is negative one, though most actual hedges involve basis risk, which occurs because the correlation does not equal negative one.

<sup>9</sup> This is an instance of a classic problem, sometimes called interest-rate risk, sometimes called the mismatch of maturities. Because deposits have short maturities and mortgages have long maturities, an increase in interest rates drives up the cost of borrowing without affecting the return on loans. The classic solution to the problem is to fund long-term loans with long-term deposits. This solution could be considered a hedging program that protects a bank from interest-rate risk. The bank's interest costs and interest income are more closely correlated when maturities are closely matched.

<sup>10</sup> Jackson, Maude, and Perraudin (1997) use portfolios from actual banks to illustrate the nature of the problem. Conventional wisdom is that alternative techniques known as historical simulation or structured Monte Carlo simulation can solve the problem (Jorion, [1998]). However, these methods have problems of their own, which have motivated the development of more exotic fixes (see Danielsson and de Vries [1997]; Zangari [1997]; Hull and White [1998]; and Rubinstein [1998]). Duffie and Pan (1997) note that the central limit theorem implies that, in the long run, returns from even a fat-tailed distribution are normal.

A second simplifying assumption, one made by most VaR models, is the use of only a small number of estimated correlations between price changes. The number of actual correlations increases dramatically with the number of securities because for each pair of stocks, a different correlation must be estimated. For 2 securities, there is 1 correlation; for 4 securities, 6 correlations; and for 100 securities, 4,950 correlations.<sup>11</sup>

To avoid estimating a multitude of correlations, some models arbitrarily specify some correlations to be zero or one. Because most true correlations are probably somewhere in this range, using a correlation of one overstates the risk because it neglects the effects of diversification; but zero correlations understate the risk by overstating the possibilities for diversification.

Other VaR models avoid estimating a multitude of correlations by using the results of multifactor models of prices. Multifactor models assume that securities prices are driven by a limited number of factors. If the prices of two securities both respond to some factor, then the prices are correlated. Often, multifactor models assume that the prices of all firms in an industry move together, so they treat a firm's industry as a factor. The correlations between price changes are then a function of a handful of factors.

These methods of avoiding having to estimate a multitude of correlations might produce high or low estimates of correlations, so they might produce an understatement or overstatement of the risk eliminated by diversifying and hedging. Regulators must be concerned because systematic underestimation of the correlations produces an overestimation of the benefits of diversification, an underestimation of the amount of risk, and a consequent underprovision of capital.

A third simplifying assumption is the use of historical data to estimate the relationship between prices. Historical data often significantly understate some risks. Options prices, in particular, behave very differently when they are substantially out-of-the-money from when they are in-the-money. (Out-of-the-money options are options that will be exercised only if there is a big price change, in-the-money options will be exercised even if there is no price change.) The price of a call option on a stock might be very stable, if the current stock price were substantially below the strike price. However, if the stock price were to rise above the strike price, the price of that option would fluctuate much more.<sup>12</sup>

A more mundane example of the understatement of risk when historical data are used concerns prepay-

ments of home mortgages and the price of mortgage-backed securities. Interest rates can affect prepayments of home mortgages, and prepayments are a major determinant of the price of mortgage-backed securities. When interest rates decline modestly, the cost of refinancing prevents most home owners from refinancing, but when rates decline significantly a wave of prepayments is almost certain to follow. A 0.5 percent decrease in interest rates would probably have a small effect on prepayments, but a decrease of 2 percent would almost certainly increase prepayments substantially. The effect of a 2 percent decrease in interest rates is not simply four times the effect of a 0.5 percent decrease. Thus, one cannot directly infer how a 2 percent decrease in interest rates will affect the price of mortgage-backed securities from the results of a 0.5 percent decrease. A period of relatively stable interest rates without any dramatic changes does not reveal the true risk of mortgage-backed securities.

What makes the problem created by the use of historical data especially acute is that many VaR models are estimated on the basis of only the most recent data. RiskMetrics can use long data series, but the most recent data receive more weight when the model is estimated—practitioners argue that only the most recent data reflect current market conditions. Recent periods, however, like most periods, tend to be relatively stable, with no dramatic changes. This complicates things for VaR models, which attempt to estimate a firm's losses as a result of unlikely events (a 1 percent VaR estimate is concerned only with events that happen less than 1 percent of the time). For many assets, the small price changes that occur in a stable market simply cannot serve as the basis for an estimation of the effect of market turmoil.

Again, there are ways of correcting for this problem. The data can be chosen to include periods when prices were extremely unstable. Such data exist, but only for

<sup>11</sup> With 4 securities, each can be compared with the 3 others for a total of 12 combinations, although this number must be divided by two to eliminate duplicates (the correlation between x and y is the same as between y and x), so there are 6 possible comparisons. With 100 securities, each is correlated with 99 others, for a total of 9,900 correlations; after duplicates are eliminated, the total is 4,950.

<sup>12</sup> This phenomenon is sometimes explained in terms of prices being "non-linear." A call option on a stock, for example, has value only if the stock price is above the strike price on the exercise date. That value changes dollar for dollar with the stock price. On the other hand, the actual stock price is completely irrelevant if it is below the strike price because the option has a value of zero. The relationship of the stock price on the exercise date to the option value is very different in the two cases.

some assets. More commonly, VaR models correct for this problem by incorporating explicit pricing models. For example, a VaR might use a Black–Sholes options-pricing model to estimate the effect of a large change in prices. Or a VaR might use a model to estimate the effect of a large interest-rate change on mortgage prepayments and the price of mortgage-backed securities.

Pricing models are also used to price securities that do not have a directly observable market price. The problem of pricing such securities is especially pronounced in the over-the-counter derivatives market, where derivatives contracts are customized to the needs of the various parties and therefore cannot be readily traded. Consequently, many derivatives have to be priced according to a model.

But pricing models have one major pitfall. There is no standard method for pricing many assets, and even for simple assets, the existing models do not always agree with observed prices. For example, the standard options-pricing model, the Black–Sholes model, tends to misprice out-of-the money options. This model assumes that price changes are distributed normally, so it systematically underestimates the probability of large price changes.<sup>13</sup>

A study by the Bank of England indicates the extent of the pricing problem. The Bank of England surveyed 40 institutions with major trading activities in London, asking them to price a number of standard derivatives as well as some more-exotic products. The 40 firms did not agree even on the value of a completely standard foreign-exchange option, and they disagreed on the extent to which prices would change with a change in the exchange rate.<sup>14</sup> As might be expected, the disagreement on the value of the more sophisticated derivatives was even greater.

So even though the pricing models are used to compensate for the fact that the risk of some securities is not always revealed in the historical data, the price models themselves disagree, and this disagreement would produce differences among the VaR models that use the pricing models. The differences in pricing models would translate directly into different capital requirements for banks, even if they held identical portfolios.

The fourth simplifying assumption is that the portfolio is fixed—does not change—during any one day, an assumption that is tenuous at best for a trading book. VaRs could, in principle, be calculated for every minute of the day, but such a calculation would be difficult for a large trading operation and of uncertain use-

fulness. In fact, VaRs are almost always calculated on a daily basis, so they measure the risk of the portfolio only at the end of the day. They completely ignore all risk that traders take during the course of the day.

The fifth simplifying assumption is that the numbers that go into the VaR model are known with certainty. Even if the other four simplifying assumptions are innocuous, VaR models still estimate risk using estimated probabilities of price changes. And even if these probabilities are estimated with the most sophisticated techniques, they are estimates—not known with precision. Significantly, VaR models do not allow for the uncertainty in the numbers they use. Nevertheless, taking an estimate as certain generally leads to an understatement of risk.<sup>15</sup>

Duffee (1996) pointed out that properly accounting for VaR models' use of estimates, not known numbers, generally increases the estimated level of risk. In his study he found the VaR which neglected this fact underestimated exposures by 33 percent.<sup>16</sup>

Another study, one by Marshall and Siegel (1997), examined the variation in the VaR estimates from four risk-management consultants, all of whom use the RiskMetrics model. Although the consulting firms all used the same model and were given the same data for the same portfolio, the VaR estimates for the four firms ranged between \$3.8 million and \$6.1 million.<sup>17</sup>

<sup>13</sup> Kupiec and O'Brien (1995a) stress this point.

<sup>14</sup> Specifically, for a European-style sterling/Deutschmark straddle, 10-month forward option at-the-money, they found a 2.7 percent standard deviation in the value, a 5.3 percent standard deviation in the delta, a 3.5 percent standard deviation in the gamma, and a 0.4 percent standard deviation in the vega. The last three terms would be used by a VaR model. For additional details see Walwyn and Byres (1997).

<sup>15</sup> This is an example of what is sometimes called "model risk." Model risk occurs because even if one is aware of all the possible problems in formulating a model, there is seldom an obvious solution to these problems, and sometimes a solution to one problem brings with it additional difficulties. Consequently, any model is a series of compromises based on well-informed judgment and any exercise of judgment oversimplifies or ignores potentially important aspects of reality. (The text discusses the fact that model-builders often ignore the reality that the numbers going into the model are estimates which are only more or less accurate.) At best, a model is an approximation of reality. "Model risk" is the risk of using an approximation.

<sup>16</sup> Duffee examined credit risk, not price risk, and he looked only at parameter uncertainty. Nonetheless, his argument applies to all VaRs because all VaRs are estimated. The 33 percent number is for the credit risk on the fixed side of a five-year U.S. dollar interest-rate swap; the estimate is specific to the model and should not be applied to other models.

<sup>17</sup> One firm submitted six different estimates of the VaR, all of which used methods slightly different from those specified by the authors. These estimates ranged from \$3.0 million to \$3.8 million.



This problem of taking estimates for reality is likely to be even more severe if the past turns out not to be prologue to the future, for all VaR models assume that future prices will behave as past prices did. Yet there is no reasonable alternative to using historical risks to forecast future risks.

All five of the simplifications discussed above are significant simply because statisticians have not developed the tools necessary to assess whether VaR models are reasonably accurate. These models are concerned with extreme events, namely very large losses, but by definition, extreme events do not occur frequently. Because the data are so sparse, statistical techniques have difficulty determining whether forecasts of extreme events are accurate.

The point can be made with the Basle Accord's method of evaluating the accuracy of VaRs. A portfolio should experience excess losses that exceed the 1 percent value at risk, on average 2.5 days a year (1 percent x 250 trading days). However, this is an average, and the actual number will obviously be higher or lower. The current Basle rules deem a model "acceptably accurate" if losses exceed the 1 percent VaR fewer than 4 of 250 days. A true 1 percent VaR model will meet this criterion approximately 89 percent of the time. However, a 2.5 percent VaR model will meet this criterion approximately 25 percent of the time. By definition, losses exceed the 2.5 percent VaR approximately two and a half times more often than they exceed a 1 percent VaR. Thus, a 2.5 percent VaR consistently understates the risks that interest regulators, yet it can pass the Basle tests for accuracy approximately 25 percent of the time.<sup>18</sup>

Work has been done to develop more powerful tests of VaR accuracy. Lopez (1998) discusses the most recent efforts. Nonetheless, these tests still are not very powerful, because by definition there are few data on extreme events.

In other words, this problem of determining the VaR forecasts' accuracy is completely independent of the method used to calculate the VaR. Unlike many of the problems discussed above, which can be avoided if slightly different methods are used (usually at the cost of creating some additional complexity and perhaps new problems), this problem is innate: whatever its methodology, a VaR model forecasts an extreme event; the accuracy of these forecasts therefore cannot be assessed without data; but by definition, the data are lacking.

## ***Banking-Book Models (Credit-Risk Models)***

Models have also been developed to estimate the credit risk of loans, and some economists and bankers have proposed using such models internally to set capital requirements for banks' banking books. J. P. Morgan also developed the standard credit model, CreditMetrics, which was released in 1997. By the end of 1998, competitors had entered the field: Credit Risk+ from Credit Suisse Financial Products, Credit-PortfolioView from McKinsey, and Portfolio Manager from KMV. These products differ widely in approach; most of the discussion below relates to the approach used by CreditMetrics. Again, the discussion highlights deficiencies of the simplest configuration of the model; and this model, too, can be configured to circumvent some of the problems discussed below.<sup>19</sup>

Loans differ substantially from securities, so banking-book VaR models differ substantially from trading-book models.<sup>20</sup> For loans the primary risk is credit risk, the risk that a loan will not be repaid. Lenders know that some fraction of their loans will not be repaid; these losses are sometimes referred to as expected losses. The difference between actual losses and expected losses is unexpected losses. Although unexpected losses are on average zero, they can be quite large.

Banking-book VaRs attempt to estimate upper bounds for unexpected losses and thereby upper

<sup>18</sup> The potential understatement of the VaR is not proportionate to the probabilities. If losses are distributed normally with a zero mean, a 2.5 percent VaR is 13 percent lower than a 1 percent VaR (2.33 standard deviations from the mean, as opposed to 2.715). However, if losses are distributed according to a Student's t distribution with four degrees of freedom (a distribution with fat tails), then the difference is approximately 26 percent.

<sup>19</sup> As with fixes to the trading-book models, the fixes to specific problems with the banking-book models generally add complexity and inevitably involve their own set of problems. Jones and Mingo (1998) and Caouette, Altman, and Narayan (1998) provide useful overviews of these models. Gupta, Finger, and Batia (1997) provide the definitive statement of CreditMetrics methodology. It should be noted that because of the methodological differences with market-risk VaRs, some authors, such as Caouette, Altman, and Narayan, explicitly deny that these models are Value at Risk models. However, because credit-risk and market-risk models have the same objective, others (such as Gupta, Finger, and Batia) do refer to credit-risk models as VaRs. Koyluoglu and Hickman (1998) discuss the differences between the various commercially available models.

<sup>20</sup> In this section the terms "bank-book model" and "VaR model" are used interchangeably to refer to the banking-book subset of VaR models.

bounds for the credit risk in the banking book. There are two basic methods of estimating credit risk, and they handle this question slightly differently. One method estimates only the probability of default; VaR models of this type are sometimes called two-state models, or default-mode models. The other method estimates not only the probability of default but also the probability of a deterioration in the borrower's credit rating; these models are called multi-state, or mark-to-market, models. The mark-to-market models are similar to trading-book VaRs in that they attempt to estimate potential losses because of changes in the value of loans the bank has already made.

The basic versions of credit-risk models use bond ratings to classify loans; for instance, a loan might be compared with a BBB bond. VaR models then assume that the probability of default and the probability of a credit downgrade for the loan are the same as those for a BBB bond. Two-state models use the probability that bonds of a particular rating would default; approximately 0.18 percent of BBB bonds were actually in default a year later. Multi-state models consider, in addition, the probability that ratings of bonds will change; approximately 5.95 percent of BBB bonds were rated A one year later, and approximately 5.30 percent were rated BB one year later. More sophisticated versions might use the bank's own rating system as well as probabilities that are based on the bank's actual experience.<sup>21</sup>

As in trading-book models, the correlations are critical. In banking-book models, however, the relevant correlations are between defaults or between rating downgrades. In this case, however, treating each loan individually is equivalent to assuming a zero correlation because the likely loss on one loan is completely unrelated to the likely loss on another loan. On the one hand this procedure of treating each loan individually almost certainly overstates the benefits of diversification: recessions generally increase the probability of default and adverse credit changes, so loan losses are almost certainly positively correlated.<sup>22</sup> On the other hand, adding the VaR from one loan to the VaR on another loan ignores the benefits from diversification: all the loans in a portfolio will almost certainly not go into default simultaneously. It is possible to calculate the correlations between defaults and between credit rating changes from bond data.<sup>23</sup>

The basic difference between two-state and multi-state models, as mentioned above, is their method for evaluating the potential losses to the lender. Two-state

models consider only the losses that result from loans going into default; the multi-state models, in addition, consider the losses in the value of the loan because of changes in the credit rating. Any loan's value depends on the likelihood of repayment, and credit ratings are based on estimates of that likelihood. Thus, once a bank has made a loan, a deterioration in the creditworthiness of the borrower causes a decrease in the value of the loan to the bank. Consequently, a loan that was comparable to a BBB bond loses value when its rating deteriorates to BB. The multi-state model considers this lost value, implicitly doing a pseudo mark-to-market procedure.

In both kinds of models, calculation of the value at risk is completely analogous to the calculation in trading-book models, except that because loans are not repriced every day, banking-book VaRs usually use a horizon of one year. The VaR is the amount of money that would be sufficient to cover most potential losses from the bank's loan portfolio.

But although the banking-book and trading-book VaRs are conceptually similar, they use very different probability models. This methodological difference means that many of the criticisms of trading-book models discussed above do not apply to banking-book models. For example, banking-book models do not use normal distributions. However, two of the criticisms apply directly. First, banking-book VaRs, like

<sup>21</sup> Carey (1998) analyzed a set of privately placed bonds, which he argues are very similar to large corporate loans. He found that more poorly-rated, privately-placed bonds defaulted at a lower rate than similar publicly-traded bonds. He suggests that the holders of the former group of bonds closely monitor the activity of the issuing companies because they, the holders, will bear any losses from default. Owners of public bonds have less incentive because they typically hold a small fraction of the outstanding bonds. If this suggestion is correct, then a model that used bond default rates would tend to overstate the amount of credit risk that a bank faces.

<sup>22</sup> The Carey (1998) study indicates that the losses from a random portfolio of non-investment-grade bonds increased significantly during recessions. Losses for the investment-grade portfolio were much less variable. Because bank loans are generally regarded as more similar to non-investment-grade bonds, the Carey study suggests banks are especially vulnerable to large losses during recessions.

<sup>23</sup> CreditMetrics actually uses correlations from stock market data. It considers intra-industry correlations, inter-industry correlations, and international correlations. For example, it considers the correlation between firms within the U.S. chemical industry, the correlation between firms in the U.S. chemical and U.S. insurance industries, and the correlation between firms in the U.S. chemical and the German insurance industries. The theory is that firms will default when the value of their assets is less than their debt. Movements in stock prices reflect the movement in asset prices, and asset prices of firms in the same country or industry tend to move together.

trading-book VaRs, estimate very few correlations. Second, both banking-book and trading-book models ignore uncertainty about the model. If the model is imprecisely estimated, then the model is very likely to understate the true risk.<sup>24</sup>

In addition, banking-book VaRs have their own special problems. In contrast to market-risk models, credit-risk models cannot use the mass of publicly available data on securities prices. Consequently, credit-risk models are difficult to implement and must make more-questionable assumptions. Most important, to use credit-risk models banks either must have extensive internal data or must make the very dubious assumption that bond-market data adequately reflect the risk characteristics of their borrowers. Modern financial economics stresses that firms that issue bonds are very different from firms that borrow from banks. Only large firms can borrow in the bond and commercial paper market, while most borrowers from banks are smaller companies. Most large firms have long histories and both national and international operations. Many other firms have fairly short histories, and most have geographically concentrated operations.

And even if a bank chooses to use bond data, it must be able to translate its own internal underwriting standards into equivalent ratings for bonds. This is no mean task.<sup>25</sup>

Theoretically, banks can avoid these problems by estimating their own probabilities and correlations using internal data. But such estimation would demand data on hundreds of loans, if not thousands; more important, the data would have to extend over many years. In the past 10 years there has been one recession, and in the past 20 years there have been two (or three—some economists consider the “double-dip” recession of 1980–82 as two recessions). Defaults and credit downgrades increase during recessions, so even with 20 years of data, a bank would have only two cases to estimate the likely effects of a recession. In addition, mergers complicate matters because the internal rating systems of the two merged banks are likely to be inconsistent. Probably only a handful of banks have operated a consistent internal credit-rating system for 20 years.

Recent studies by Robert Morris Associates (1997) and Treacy and Carey (1998) examined the credit-rating systems at very large banks operating in the United States. Both studies found that these banks generally have rating systems in place, but they noted a number of problems even with these banks’ systems. One of the most severe is that many large banks apparently fail

to differentiate between the riskiness of different loans.<sup>26</sup>

What makes these observations especially important is the virtual impossibility of validating any banking-book VaR. As discussed in connection with trading-book VaRs, any test of a VaR model necessarily involves extreme events because VaR models are supposed to estimate potential losses under extreme circumstances. Trading-book models are hard to validate even with daily data, and of course banks do not reevaluate credit ratings on anything like a daily basis. Even if banks reevaluated credit ratings every month, there would be only 12 observations a year. With monthly reevaluations, a bank would take 20 years to gather as much data about its banking-book VaR as it could gather about its trading-book VaR in one year (approximately 250 trading days). If credit ratings were reevaluated once a quarter, a bank would need 80 years. If evaluating trading-book VaRs is difficult, assessing the accuracy of banking-book VaRs is virtually impossible.

### *The Precommitment Approach*

One current proposal to revise the Basle Accord with respect to risk-based capital requirements would permit each bank to precommit to a maximum loss, and if actual losses exceeded the maximum predicted loss, either the bank would be fined or its capital requirement would increase in subsequent years.<sup>27</sup>

The maximum loss could be determined by an internal risk-management model or by some other technique. Most of the work that has been done on this approach is theoretical and has generally assumed that each banker actually knows the relevant risks. One could interpret this assumption as expressing a belief that each bank has a perfect internal model of risk. Actually, however, under this approach a bank need not have any model. Rather, a bank’s capital requirement

<sup>24</sup> As previously noted, Duffee (1996) made this point about credit risk, not about price risk.

<sup>25</sup> Treacy and Carey (1998) discuss the complications at some length. The most important difference between bond ratings and bank rating systems is that bond ratings reflect long-run creditworthiness, whereas bank rating systems focus on current financial health. Probably the reason for the difference in emphasis is that bonds typically have longer maturities than bank loans.

<sup>26</sup> Treacy and Carey (1998), 902, observe that 36 percent of the banks use systems that “assign half or more of their loans to a single risk grade. Such systems appear to contribute little to the understanding and monitoring of risk posture.”

<sup>27</sup> This approach is closely identified with the work of Kupiec and O’Brien (1995b, 1997, 1998).

would depend on that bank's own assessment of risk. Probably the most rigorous method of assessing risk is to use internal models, but the bank would be able to use any method.

Required capital would equal some multiple of the maximum predicted loss. In this respect, the precommitment approach closely parallels the current (since 1996) use of trading-book VaRs. The difference lies in the fact that fines and increased capital requirements could be imposed if a bank did not meet its commitment. The central issue of the precommitment approach is the strength and usefulness of sanctions as incentives to banks not to understate their risk.<sup>28</sup>

The theoretical work in this area has assumed that each bank has an incentive to decrease its capital. If a bank decreases capital, its stockholders gain in two ways. First, they receive cash either through dividends or through stock repurchases. Second, if the bank can decrease capital, shareholders have less money at risk. Moreover, raising capital is costly to stockholders inasmuch as the bank itself has to pay underwriting costs (a payment that lowers its profitability), and current stockholders have to give the new stockholders a share in future profits. On the other hand, a bank with less capital is more likely to fail. If a bank fails, its stockholders lose any future profits from the bank.

Generally economists assume that despite the risk, stockholders prefer low levels of capital. This assumption implies that banks—which act in the best interest of the stockholder—prefer to understate their risk and thereby be permitted to hold low levels of capital. However, theory cannot determine whether the incentive to maintain a higher level of capital (an incentive in the form of possible sanctions) is stronger than the incentives to decrease capital.<sup>29</sup> If a bank has good lending prospects and is initially well-capitalized, then the possibility of sanctions can prevent it from understating its risk. The possible loss of future profits and the possible sanction together can act as deterrents.

On the other hand, if a bank has poor lending prospects and is weakly capitalized, the threat of sanctions will be ineffective for a number of reasons. First, the bank has few future profits to lose. Second, if the bank gambles and wins, the bank will not have to pay a fine. If the bank gambles and loses enough that it fails, regulators will not be able to collect the fine. Regulators can collect the fine only if the bank loses money, but not enough money that the bank is forced into insolvency. Third, if the bank accurately reports its risk, the bank may have to raise more capital, im-

posing a cost on current stockholders. Under these conditions, stockholders would prefer that the bank mislead regulators.<sup>30</sup>

This analysis of the incentive to maintain a higher level of capital assumes that the threatened sanctions are credible. However, would regulators actually be willing to levy a fine that would materially weaken a bank that had already suffered substantial losses? Would regulators actually levy a fine that would force a bank into insolvency?

Bankers cannot be certain. They do not know that regulators will actually implement the sanctions. This uncertainty in itself weakens the incentives for banks to produce accurate assessments of their own risk. A penalty that might or might not be imposed is a much weaker deterrent than a definite, unavoidable penalty. A banker who doubts the regulators' resolve might decide to understate the risk of the bank, thereby reducing its capital requirement, whereas if the regulators were completely credible the same banker would correctly report the level of risk.

The problem of uncertainty is likely to be most severe at these banks that have central roles in the financial system. A failure of one of these banks may well cause financial chaos; and thus it is considered a "systemic risk." Would regulators in fact impose penalties on one of these banks, possibly driving it into insolvency, and risk possible systemwide financial instability? Unless the clear answer is yes, these banks have weak incentives to report their risks correctly.

And even if banks believe the sanctions are certain and the banks are always forthcoming with regulators, the precommitment approach still does not guarantee the reliability of bankers' risk assessment. As observed above, the theoretical work assumes that bankers are fully informed about the bank's level of risk and that the precommitment approach simply gives them incentives to convey this information to regulators. But the discussion of VaR models above suggests that banks do not have full information about their own risks, especially the risks in their banking books.

<sup>28</sup> The New York Clearinghouse is experimenting with a similar precommitment approach for its own members.

<sup>29</sup> Most firms also face higher borrowing costs if they decrease capital, because they are more likely to fail and less likely to repay their loans. Deposit insurance significantly reduces this incentive for banks.

<sup>30</sup> This is a form of moral hazard, a problem in virtually all insurance plans. The most noted advocates of the precommitment approach concede this point. See Kupiec and O'Brien (1995b, 1997, 1998).

Although regulatory sanctions give banks an incentive to develop this information, the costs of doing so are substantial. For bankers to be willing to incur both the costs of holding capital and the costs of developing reliable information on their risks, the potential sanctions must be sufficiently onerous.

### **Conclusion:** ***Should Internal Models Be Used?***

The preceding discussion has pointed out serious deficiencies in the proposals that regulators use the banks' own internal risk-management models in setting capital requirements. More important, the preceding discussion has argued that there is a substantial difference between trading- and banking-book VaR models. That difference is simply the availability of data. The large volume of data on securities prices has permitted the development of reasonable trading-book models. In contrast, data on loan performance are sparse, and the preeminent banking-book VaR models use bond data as a substitute. Furthermore, because securities prices are available daily, evaluating the reliability of trading-book VaRs is feasible, though still difficult. In contrast, the available statistical tests do not permit any sort of reasonable assessment of loan banking-book VaRs in the foreseeable future.

The precommitment approach does not solve the basic problems with internal risk-management models. Regulation cannot make inaccurate models accurate. The precommitment approach does give most banks a reason to develop such models and to report the results truthfully. But for some banks, notably undercapitalized banks and banks that do not believe the threats of regulators, this incentive is not sufficient.

Despite the problems and deficiencies, internal models produce the bank's best estimate of its possible losses, and internal models can incorporate the risk-reducing effects of diversification and hedging. These models undoubtedly measure the adequacy of a bank's capital more accurately than the current Basle standards.

Yet the Basle standards have some important advantages over internal models. Because capital standards—Basle or other—have legal standing, they must be both verifiable and uniform across time and institutions. They must therefore be based on simple, comprehensive calculations.<sup>31</sup> The Basle standards certainly meet all these criteria better than any approach that relies on internal risk-management models.

<sup>31</sup> This is the argument of Estrella (1995).

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# Recent Developments Affecting Depository Institutions

by Lynne Montgomery\*

## REGULATORY AGENCY ACTIONS

### *Interagency Actions*

#### *New Agreements for Supervision of Foreign Banks*

On December 4, 1998, the Conference of State Bank Supervisors announced that federal and state banking regulators have signed two new agreements designed to improve supervision of foreign banks operating across state lines. The first accord, the Nationwide Foreign Banking Organization Supervision and Examination Coordination Agreement, is aimed at helping states coordinate their examination and supervisory responsibilities by sharing information about particular banks. Under this accord, each foreign bank will be assigned one state banking department that will coordinate scheduling and planning of exams and will prepare a single examination report on all the foreign banking firm's U.S. operations. The second agreement, the Nationwide State/Federal Foreign Banking Organization Supervision and Examination Coordination Agreement, creates a similar arrangement between the states, the Federal Reserve Board, and the Federal Deposit Insurance Corporation. Under this agreement, the Federal Reserve Banks and regional FDIC offices will work with the foreign bank's state bank coordinator. *BBR*, 12/14/98, p. 909-910.

#### *Fair Lending Exam Procedures*

On January 5, 1999, the Federal Financial Institutions Examination Council (FFIEC) released

*Interagency Fair Lending Examination Procedures*, a document which establishes a uniform set of procedures to be used in the Equal Credit Opportunity Act and Fair Housing Act compliance examinations conducted by the FFIEC member agencies. The Equal Credit Opportunity Act prohibits discrimination in any aspect of a credit transaction. The Fair Housing Act prohibits discrimination in all aspects of residential real estate-related transactions. The new fair lending examination procedures are intended to provide a framework for the majority of fair lending examinations, but the procedures may be augmented by each agency. The agencies may also provide their examiners and the institutions they regulate with additional procedures as needed to implement the fair lending examination procedures effectively. The FFIEC member agencies include the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), the Office of Thrift Supervision (OTS), the National Credit Union Administration (NCUA), and the Federal Reserve Board. *BBR*, 1/11/99, p. 50.

#### *New Rating System for Information Technology Systems*

On January 19, 1999, the FFIEC issued a revised rating system for banks' and thrifts' data processing

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Reference sources: *American Banker* (AB); *The Wall Street Journal* (WSJ); *BNA's Banking Report* (BBR); and *Federal Register* (FR).



operations. The revised system, called the Uniform Rating System for Information Technology (URSIT), will track more closely the Uniform Financial Institutions Rating System ratings definitions for banks' and thrifts' safety and soundness, referred to as CAMELS ratings. Previously, the FFIEC agencies rated financial institutions and their vendors on the risks posed by information technology systems to the institutions under a system called the "IS" rating system. Under the IS system each provider is given a composite rating from 1 to 5 on: the adequacy of the institution's information technology audit ability; the capability of the institution's information technology management; the adequacy of the institution's development and programming; and the quality, reliability, availability, and integrity of the institution's technology operations. The revised rating system places more emphasis on risk management, and contains four components that examiners will assess: auditing; management; development and acquisitions; and support and delivery. Under the revised system the examiners will evaluate the functions identified within each component to assess the institution's ability to identify, measure, monitor, and control information technology risks. The Exam Council recommends that the agencies implement the revised URSIT by April 1, 1999. *BBR*, 1/25/99, p. 135-136.

### ***New Call Report Form***

On January 21, 1999, the federal banking agencies issued a joint notice alerting insured depository institutions to new revisions to the quarterly Reports of Condition and Income (Call Reports). Federally insured banks are required to file quarterly Call Reports detailing their financial condition, and thrifts and credit unions submit similar reports. Most of the Call Report revisions clarify filing instructions and provide additional guidance in certain areas of the Call Report form. In particular, the revised Call Report eliminates the "high-risk securities" items from the securities schedule, and expands the scope of the existing "purchased credit-card relationships" item to include "nonmortgage servicing assets." Further, the updated form adds new items that will apply to banks after they adopt new Financial Accounting Standards Board guidance on financial derivatives accounts. The revisions are effective for the March 31, 1999, filing date. *BBR*, 2/1/99, p. 189.

### ***New Risk-Based Capital Rules***

Federal banking and thrift regulators adopted final rules making the treatment of certain loans and other assets for banks' and thrifts' required capital calculations more consistent among the agencies. The final rules cover the capital treatment of construction loans on pre-sold residential properties, real-estate loans secured by junior liens on one- to four-family residential properties, and investments in mutual funds. The rules also set uniform Tier 1 leverage ratios for banks and thrifts. The rules were adopted by the Federal Reserve Board, the FDIC, the OCC, and the OTS, and are effective April 1, 1999. *BBR*, 3/8/99, p. 424.

### ***Guidance on Subprime Lending***

On March 3, 1999, the FDIC, the Federal Reserve Board, the OCC, and the OTS jointly issued Interagency Guidance on Subprime Lending. The guidelines are intended to remind banks and thrifts of the risks inherent in subprime lending and to outline the types of controls the agencies expect banks to have in place before engaging in subprime lending. *PR-8-99, FDIC*, 3/3/99.

### ***Federal Deposit Insurance Corporation***

#### ***Real-Estate Survey – January 1999***

The January 1999 issue of the *Survey of Real Estate Trends* reported a slowdown in the expansion of the nation's residential and commercial real-estate markets during the late fall and early winter. The January survey contained an increased number of respondents reporting "no change" in market conditions during the quarter. The survey polled 304 examiners and asset managers from federal bank and thrift regulatory agencies about developments in their local markets in the preceding three months. The proportion of respondents reporting that housing markets were on the upswing during the three-month period slipped to 29 percent from 36 percent in October. Sixty-five percent characterized supply and demand as "in balance" compared to 61 percent in October, while 15 percent cited excess supply, down from 17 percent in October. As for local commercial real-estate markets, assessments continued to be positive, but not as positive as in earlier surveys. Twenty-six percent of the survey respondents in January observed better conditions than three months earlier, down from 28 percent in October.

The national composite index used by the FDIC to summarize results for both residential and commercial real-estate markets was 61 in January, compared to 62 in October. Index scores above 50 indicate improving conditions, while index scores below 50 indicate declining conditions. *Survey of Real Estate Trends, FDIC, January 1999.*

### ***Trust-Preferred Stock Rule***

On February 19, 1999, the FDIC clarified the authority of state banks to invest in trust-preferred securities. In a letter to bank chief executive officers, the FDIC said that, as long as state law permits it, state banks regulated by the FDIC may buy trust-preferred stock in unlimited quantities. Trust-preferred stock is issued by a trust, or tax-free subsidiary, of a bank holding company. The trust issues common and preferred shares, keeping the former and selling the preferred stock to investors. *AB, 2/22/99.*

## ***Federal Reserve Board***

### ***Subpart G of Regulation Y***

A final rule, which revises Subpart G of Regulation Y, permits bank holding company securities units to underwrite and deal in mortgage-backed securities without proving that the loans underlying the instruments are supported by appraisals that meet the Federal Reserve Board standards. The final rule applies only to banks' securities units established under Section 20 of the Glass-Steagall Act, which are given limited authority to engage in investment banking activities. The new final rule, which became effective on December 28, 1998, does not affect the appraisal requirements for federally insured depository institutions. *BBR, 12/7/98, p. 864.*

### ***HMDA Data Reporting Exemption Unchanged for 1999***

The Federal Reserve Board announced that depository institutions with assets of \$29 million or less as of December 31, 1998, would not be required to report data on their housing-related lending activities in 1999. Provisions in the Economic Growth and Regulatory Paperwork Reduction Act of 1996 require the Federal Reserve Board to adjust the asset-size exemption threshold annually on the basis of changes in inflation as measured by the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPIW). The exemption threshold for 1998

was \$29 million. The CPIW increase of 1.3 percent for 1998 did not result in an adjustment large enough to trigger a hike in the exemption level for 1999. *BBR, 1/4/99, p. 9.*

### ***Interest Rates Remain Unchanged***

After trimming short-term interest rates three times in the fall of 1998, the Federal Reserve Board left rates unchanged when they met in December 1998 and again in February 1999. The federal funds rate remains at 4.75 percent, and the discount rate remains at 4.50 percent. *WSJ, 2/4/99.*

### ***Revised Limits on Use of Securities to Back Loans***

A January 21, 1999, legal opinion by the Federal Reserve Board will make it easier for Federal Reserve member banks to make loans backed by securities issued by corporate affiliates. The ruling involved an interpretation of Section 23A of the Federal Reserve Act, which is designed to maintain arm's-length dealings between member banks and affiliates. Since 1984, the Federal Reserve has considered loans backed by securities of an affiliate to be backed entirely by those securities, even if the stock only amounted to a fraction of the loan amount. However, the new ruling permits loans to be valued differently. Now, loans to unrelated third parties (not affiliates) will be valued either at the fair market value of the loan minus the amount of collateral offered by the nonaffiliate, or the fair market value of the affiliate's shares that are used as collateral, whichever is less. In addition, if the nonaffiliate collateral, valued at its fair market rate, is enough to cover the loan amount, then the loan would not be included in the bank's quantitative limits for purposes of Section 23A. *BBR, 2/1/99, p. 192-193.*

### ***Survey on Lending Standards***

A February 1999 Federal Reserve Board survey of senior loan officers concludes that domestic banks are no longer tightening business lending standards as they had done last fall, but institutions remain concerned about the effect of uncertain economic conditions on their lending activities. Compared to the results of loan officer surveys conducted last September and November, fewer U.S. banks reported stricter lending standards to businesses of all sizes. Institutions continued to report stricter business loan terms, but not as restrictive as the terms granted in November. The survey is based on responses from

55 domestic banks and 23 U.S. branches of foreign banks. *BBR*, 2/15/99, p. 287.

## **Office of the Comptroller of the Currency**

### ***Updated Risk-Management Guidance***

On January 25, 1999, the OCC issued supplemental guidance on managing the risks of financial derivatives and securities trading activities. The new guidance applies to a wide range of bank activities, including extensions of credit to hedge funds and other highly leveraged institutions that could threaten the stability of world financial markets if they were to fail. The supplemental guidance highlights existing shortfalls in the risk-management systems within financial institutions, and identifies sound risk-management practices that should be in place for all significant derivatives trading activities. The guidance, which is effective immediately, is intended to help OCC examiners identify weaknesses in the design of national banks' risk-management systems. *BBR*, 2/1/99, p. 185.

## **Office of Thrift Supervision**

### ***Less Restriction on Cash Dividends***

Under a final rule issued on January 19, 1999, the OTS will permit well-run, healthy thrift institutions to pay cash dividends without first notifying their federal regulator. Previously, all thrifts had to give the OTS notice or apply to the agency to make a dividend distribution. Under the new rule, institutions that are not subsidiaries of a savings-and-loan holding company can qualify for a capital distribution without a notice or application to OTS if they meet certain conditions, including retaining their well-capitalized designation following the distribution and having CAMELS and compliance ratings of 1 or 2. Other institutions either have to notify the OTS or obtain the agency's approval, depending on the condition of the institution and the amount and nature of the capital distribution, but they may now file a schedule of proposed capital distributions for a year at a time, rather than filing separate notices. The final rule is effective April 1, 1999. *PR-OTS-99-03*, 1/19/99.

## **National Credit Union Administration**

### ***Final Chartering Rule***

On December 17, 1998, the National Credit Union Administration approved comprehensive changes to its chartering and field of membership policies for federal credit unions. The new rules implement the requirements of the Credit Union Membership Access Act, which was signed into law on August 7, 1998. The primary revisions concern the NCUA's policy on various types of federal credit union charters, and the criteria necessary to amend a credit union's field of membership. The final rule also clarifies overlap issues, mergers, low-income policies regarding low-income charters and service to underserved areas, the definition of immediate family member or household, and the "once a member, always a member" policy. The new rules are included in the NCUA's revised Chartering and Field of Membership Manual. *PR-NCUA*, 12/17/98; *BBR*, 1/4/99, p. 24.

On January 8, 1999, the American Bankers Association (ABA) filed a lawsuit, claiming that the Chartering and Field of Membership Manual oversteps the boundaries set by Congress in the Credit Union Membership Access Act. The ABA is asking the court for an injunction against any new credit union approval. The ABA also wants the court to rescind any expanded field of membership approval previously granted. *BBR*, 1/25/99, p. 165.

### ***Loan Rate Ceiling Maintained***

The NCUA approved a final rule to maintain the current 18 percent interest-rate ceiling on loans by federal credit unions, instead of allowing the ceiling to revert to 15 percent. The rate ceiling was scheduled to revert to 15 percent on March 9, 1999; however, with the new ruling, the ceiling will remain at 18 percent for the period from March 9, 1999 through September 8, 2000. The NCUA reported that a 15 percent ceiling would restrict certain categories of credit and adversely affect the financial condition of a number of federal credit unions. At the same time, prevailing market rates and economic conditions do not justify a rate higher than the current 18 percent ceiling. The NCUA Board is prepared to reconsider the 18 percent ceiling at any time should changes in economic conditions warrant. *BBR*, 2/15/99, p. 308.

## STATE LEGISLATION AND REGULATION

### *Oklahoma*

On December 1, 1998, the OCC announced that it has entered into an agreement with the Oklahoma Insurance Department to share information about complaints arising from national banks selling insurance products in Oklahoma. The agreement also calls for the agencies to communicate with each other on matters of common interest, such as regulatory and policy initiatives. The agreement is the first agreement between the OCC and a state insurance department on these issues. *BBR, 12/7/98, p. 861.*

### *Utah*

On November 5, 1998, the Utah District Court ruled that new membership in geographically-based

credit unions is limited under Utah law to identifiable areas, and Utah credit unions are prohibited from soliciting or accepting members beyond those geographic areas. The ruling resulted from a legal case in which the Utah Bankers Association sued Utah credit unions, seeking to stop them from adding new members from outside their fields of membership. Judge William A. Thorne ruled in favor of the Utah Bankers Association and stated that Utah legislation limits membership in a geographically-based credit union to an identifiable neighborhood, community, rural district or county. He also stated that no exception exists to extend that geographic limitation beyond a single county. *BBR, 12/7/98, p. 879.*

## BANK AND THRIFT PERFORMANCE

### *Fourth-Quarter 1998 Results for Commercial Banks and Savings Institutions*

The banking industry earned a record \$61.9 billion in 1998, setting an earnings record for the seventh year in a row. However, the fourth-quarter 1998 earnings of \$14.9 billion for commercial banks were lower than the third-quarter earnings by \$148 million. The earnings decline was caused by weaknesses in international operations and rising overhead costs and other expenses related to merger and restructuring of a few large banks. Banks' annualized return on assets (ROA) was 1.11 percent in the fourth quarter, compared to 1.15 percent in the third quarter of 1998 and 1.24 percent in the fourth quarter of 1997. The number of problem banks dropped from 70 in the third quarter to 69 in the fourth quarter, and assets of problem banks were approximately \$5.4 billion at the end of 1998. Although three insured com-

mercial banks failed in 1998, there were not any bank failures during the fourth quarter.

FDIC-insured savings institutions posted record profits of \$10.2 billion in 1998, despite a decline in earnings in the fourth quarter. Savings institutions earned \$2.0 billion in the fourth quarter of 1998, \$921 million less than in the third quarter. The industry's average annualized ROA declined from 1.14 percent in the third quarter to 0.76 percent in the fourth quarter. Despite the fourth-quarter decline, the industry's ROA for the full year rose to 1.01 percent in 1998 from 0.93 percent in 1997. For the second consecutive year, no federally insured savings institutions failed. The number of problem thrifts fell to 15 from 18 in the third quarter, but the assets of problem thrifts rose from \$2.9 billion in the third quarter to \$5.9 billion in the fourth quarter. *FDIC Quarterly Banking Profile, Fourth Quarter 1998.*

## RECENT ARTICLES AND STUDIES

State-chartered credit unions are as safe and sound as federally chartered credit unions, according to a study conducted by The Filene Research Institution, a credit union research group at the University of Wisconsin in Madison, Wisconsin. The researchers examined 4,546 state-chartered credit unions and compared them to 7,149 federally chartered credit unions over a ten-year period from 1986 to 1996. The researchers found many similarities between state-chartered and federally chartered

credit unions, including similarities in: median numbers of members; assets; capital; delinquency; charge-off ratios; net income ratios; loan-to-savings ratios; and safety and soundness. The report is entitled *Financial Strength: A Comparison of State and Federal Credit Unions*. *BBR, 1/4/99, p. 27.*

A study, conducted by Allen N. Berger of the Federal Reserve Board and Rebecca S. Demsetz and Philip E. Strahan of the Federal Reserve Bank of New York, shows that bank mergers improve the effi-

ciency of the payments system while allowing banks to earn profits more efficiently and diversify their loan portfolios. On the downside, consolidation increases the risk that a bank failure could cause systemic problems and that the government would expand the safety net to keep a really large institution from failing. The report is entitled *The Consolidation of the Financial Services Industry: Causes, Consequences, and Implications for the Future*. AB, 1/8/99.

A paper entitled *An Overview and Analysis of Community Bank Mergers* states that community banks that undertake mergers often become more profitable and operate more efficiently. Joe Van Walleghem and Paul Willis of the Federal Reserve Bank of Kansas City conducted a case study of 19 community banks. They find community banks cut costs by consolidating back-office operations, rather than by closing branches. After mergers, the banks are also able to make larger loans and use personnel more efficiently. AB, 1/29/99.

In a paper titled *Bank Industry Consolidation: What's a Small Business to Do?*, Loretta J. Mester, an

economist at the Federal Reserve Bank of Philadelphia, concludes that small businesses should not fear consolidation of the banking industry. Ms. Mester finds that businesses with hard-to-evaluate financial conditions will be drawn to community banks, which will continue to offer flexible loan terms. However, these businesses will pay above-market rates for credit. Larger companies with easy-to-evaluate financial conditions will increasingly turn to big banks, which use credit scoring and automated loan applications to keep loan rates down. AB, 2/12/99.

James T. Moser, an economics adviser to the Federal Reserve Bank of Chicago, writes that credit derivatives offer banks a low-cost alternative for managing risk. In his paper titled *Credit Derivatives: Just-in-Time Provisioning for Loan Losses*, Mr. Moser compares credit derivatives to loan-loss provisioning and finds that their risk-reduction benefits are approximately equal. However, credit derivatives may also be used to reduce a bank's capital requirements, a cost saving not available with traditional loan-loss provisioning. AB, 2/12/99.

## INTERNATIONAL DEVELOPMENTS

### *Basle Committee*

The Basle Committee on Banking Supervision issued a report titled *Banks' Interactions with Highly Leveraged Institutions*, which provides guidance on the way banks deal with hedge funds and other highly leveraged institutions (HLIs). Among other things, the Basle Committee's guidance encourages banks to set meaningful credit limits for HLIs, develop more accurate measures of exposures to HLIs, and employ sound due-diligence practices.

*Dow Jones Capital Markets Report, 1/29/99.*

### *Euro Launched*

On January 1, 1999, the Euro was launched into world financial markets. The Euro is a common currency that will replace the national currencies of eleven countries, including Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. With the introduction of the Euro, the bilateral exchange rates between the 11 countries as well as against the Euro were permanently locked, but the common currency only came into being in electronic form. Euro bills and coins will not start circulating until 2002. WSJ, 1/4/99; BNA, 1/18/99, p. 119.

### *Mexico*

In December 1998, both houses of Mexico's Congress approved reform of the financial-services sector, resolving an eight-month dispute over a \$60 billion bank bailout plan. As part of the bailout package, lawmakers voted to lift remaining restrictions on foreign ownership of large Mexican banks and to give lenders an opportunity to swap illiquid bad-debt paper off their books for bonds that should be easier to trade. The result will allow Mexican banks to restructure their balance sheets and strengthen their capital base. WSJ, 12/15/98.

### *Japan*

On December 15, 1998, the Japanese government inaugurated the Financial Reconstruction Commission, a new administrative office created to speed the cleanup of commercial banks' bad-loan portfolios. The Commission is an independent government body that will provide stronger administrative powers to dispose of bad loans and prevent intervention from the Ministry of Finance and other administrative offices. It is also responsible for formulating long-term analysis and policies regarding the Japanese financial industry and markets. One of the

first tasks of the Commission is managing two troubled banks, Long-Term Credit Bank of Japan, which was nationalized in October 1998, and Nippon Credit Bank, which was put under temporary nationalization on December 13, 1998.

On February 15, 1999, the Commission granted approval for a 7.45 trillion yen (\$65 billion) bailout of 15 of the nation's largest banks. Under the bailout plan, the government will buy preferred shares and subordinated debt to rebuild capital in the banks. In return, the banks will be required to cut costs and improve businesses. *BBR, 12/21/98; AB, 3/5/99.*