
FRBSF WEEKLY LETTER

Number 93-17, April 30, 1993

Is Banking on the Brink? Another Look

During the recent recession, most U.S. banks were hit by increasing problem loans and defaults; on top of this, many banks faced losses because of their holdings in distressed areas like commercial real estate. At the same time, banks were expanding into a variety of new and non-traditional areas. The combination led some to believe that the banking industry was on the brink of disaster.

Problems in banking are a public concern because taxpayers are ultimately responsible for federal deposit insurance losses. The insurance fund's liability roughly depends on expected losses due to bank failures, which in turn depend on bank risk. Large increases in risk could call for some form of policy response, such as higher minimum bank capital standards, restrictions on bank activities, or structural changes in the supervision and regulation of banking. Indeed, major new federal banking laws were enacted in both 1989 and 1991 in an effort to deal with perceived threats to the deposit insurance system. Against this background of public concern, it is vital that the condition and riskiness of the industry be characterized accurately.

This *Letter* analyzes trends in the riskiness of U.S. banks over the past four years. Three measures of risk are derived from financial market data, each shedding light on a different aspect of risk. The results show that while U.S. banks have been moving toward riskier assets and activities, increased capital has offset much of this increased operational risk. As a result, although the federal deposit insurance liability soared during the recent recession, it has declined to more moderate levels as bank capital ratios have risen.

What matters in bank risk?

For any bank, two elements determine the expected losses to the deposit insurance fund: the probability that the bank's own capital will be exhausted (causing the bank to fail) and the size of any consequent deposit insurance payout. These two factors reflect two broad types of banking risk. The first is operating risk, which can be measured most directly in terms of the variability of bank earnings. This risk can be

quantified by the statistical standard deviation of the rate of return on all of a bank's investments and activities, referred to as "asset volatility." All else equal, a bank with higher asset volatility is more likely to fail, and if it fails is more likely to impose a larger loss on the insurance fund. The second broad type of risk is leverage or financial risk, which depends inversely on a bank's capital ratio (the ratio of capital to total assets). For a given level of asset volatility, a bank with a lower capital ratio is more likely to fail.

Calculating capital ratios and asset volatilities in order to measure risk is not straightforward, and many of the traditional methods have failed to give accurate and timely indications of changes in the riskiness and condition of banks. One possible failing of traditional approaches is that they rely largely on accounting information, which may not be relevant for analyzing potential losses to the deposit insurance fund; deposit insurance losses at failed banks depend on economic values, or "market" values, of bank assets and liabilities, not on their historical cost.

New data, new methods

In an effort to develop new analytical tools, increasing attention has focused on the use of price data from financial markets. Market prices succinctly capture a huge amount of diverse information, reflecting consensus opinions of many market participants, each of whom is diligently trying to gather and use the best and most accurate information. Financial models have been created to use this market information to gauge the condition of banks.

In particular, models have been developed to infer the market value of capital and asset volatility by working backwards from the stock prices of banks. These relatively new models are based on "contingent claim" analysis: The level and volatility of bank stock prices are used to divine bank capital ratios and asset volatilities and to filter out any effects deposit insurance might have on stock prices. In theory, the capital ratios and volatilities derived through these newer methods reflect economic values and should be superior for the analysis of risk.

FRBSF

Exclusive reliance on market-based methods probably is inappropriate. Traditional financial statement analysis provides useful insights, and the information collected by bank supervisors through on-site examinations and regular off-site reporting are valuable. But market-based data are at least a useful supplement to these other sources, providing a different perspective on the same problems, and at best may give a more accurate characterization of risk in banking.

The study

The study examined 150 banks and bank holding companies from the Compustat database from January 1989 through September 1992. These firms tend to be larger than the industry average, and thus may not be completely representative. However, they give direct information about an important segment of the industry, and may serve as a barometer for U.S. banking as a whole.

Market capital ratios and asset volatilities were computed quarterly for each bank; results for each date were then averaged, with individual bank results weighted by bank asset size. Financial risk rises if the average market capital ratio decreases, whereas operating risk goes up if average volatility increases. The estimated capital ratios and asset volatilities also were combined to examine the net effect of the two basic types of risk on deposit insurance liability. (The deposit insurance contract is in effect another contingent claim, the value of which depends on asset volatility and the capital ratio.) In addition to its intrinsic interest, the deposit insurance liability serves as a valuable summary measure of risk, because it incorporates the net effects of both financial risk and operating risk. (The actual computation of all three measures of risk is fairly complicated; see Furlong 1988.)

Trends in operating risk and financial risk

Figure 1 shows the evolution of bank operating risk; banks became somewhat riskier over the last few years, especially from mid-1990 to mid-1991. This jump roughly coincides with the recession, although it lags the official timing of the downturn by about one calendar quarter. (The NBER dates the recession from July 1990 to April 1991.) Asset volatilities leveled out, and even declined slightly, in the most recent quarters. Viewed over the entire period, the rise in operating risk roughly matches the rate of increase Furlong (1988) and Levonian (1991) find for 1981–1989. Thus bank operating risk seems to be con-

tinuing an upward trend that extends back at least to the beginning of the 1980s. The figure also displays separate results for 24 banks and holding companies based in the Twelfth Federal Reserve District (nine western states); operating risk has been higher on average for Twelfth District banks, with the time pattern roughly tracking the national average.

Figure 1:
Average Standard Deviation
of Return on Assets

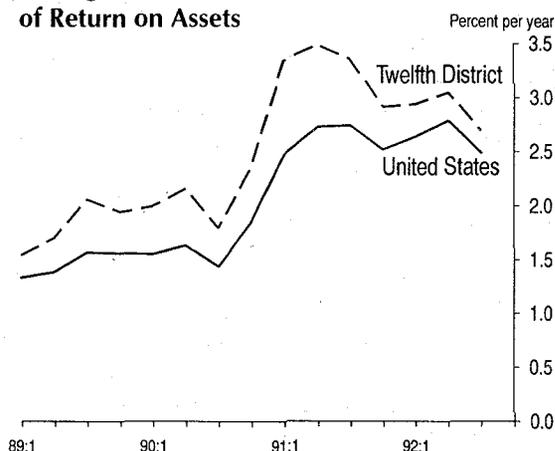
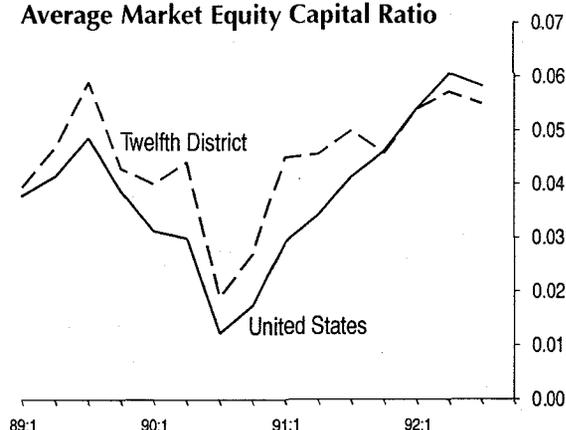


Figure 2 shows the weighted-average market capital ratio. The low point in bank capital ratios—and hence the high point in financial risk—coincides with the beginning of the sharp rise in operating risk in 1990. However, as asset volatility rose, market capital ratios began a sustained increase, with the average ratio for this group of banks rising nearly five-fold from the third quarter of 1990 to the third quarter of 1992. Capital ratios generally have been higher for Twelfth District banks, with the pattern roughly mimicking the national average; however, capital ratios fell over the last year of the sample, raising financial risk for western banks relative to the country as a whole.

Figure 2:
Average Market Equity Capital Ratio



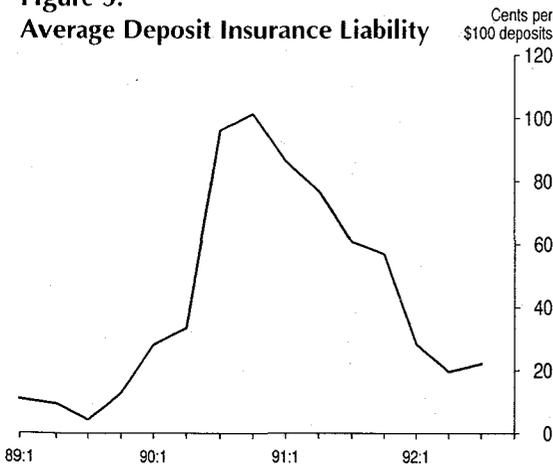
The fact that financial risk fell as operating risk rose should not be a surprise. A positive relationship between capital and asset risk has recently been codified in the form of risk-based capital standards, and other studies have shown that even before these formal standards were implemented banks with higher asset volatility generally had higher capital ratios. For the banks and the time period studied here, simple statistical analysis reveals that capital ratios increase by about 2.25 percentage points for each 1 percentage point increase in asset volatility. Because of the inverse correlation between operating risk and financial risk, looking separately at trends in either bank capital ratios or the riskiness of bank assets and activities can give a misleading picture of overall banking risk. Changes in the two may at least partially offset one another; hence, a summary measure of risk is indispensable.

Putting it together: how close to the brink?

Figure 3 shows the average deposit insurance liability over the sample period for the United States as a whole. This estimate of the liability, expressed in cents per hundred dollars of deposits, reflects the economic cost of insuring bank deposits. As discussed above, it is not only a direct reflection of the risk of losses to the deposit fund, but also a summary measure of bank risk that subsumes both operating risk and financial risk. The figures are sensitive to certain assumptions made in the modeling; as a result, the time pattern is more trustworthy than the precise dollar amounts, and is the appropriate focus of attention.

Risk to the deposit insurance fund began to go up in the third quarter of 1989 as capital ratios began to fall, and markedly soared in mid-1990.

Figure 3:
Average Deposit Insurance Liability



As Figure 2 showed, bank capital had declined to very low levels at that point. As operating risk began its sharp rise—perhaps as a result of the recession—the position of the deposit insurance fund became increasingly precarious. However, once the increase in asset volatility leveled off, and as capital ratios continued to improve, the insurance liability declined to near (although still somewhat above) its previous levels. Consistent with this trend, bank failures in 1992 and 1993 have been well below earlier FDIC predictions.

Conclusion

Banks have been increasing the riskiness of their business since at least the beginning of the 1980s. Moreover, a jump in asset risk in mid-1990, combined with the depressed capital ratios prevailing at that time, caused a substantial increase in overall banking risk, as reflected in the potential for deposit insurance fund losses. However, a subsequent leveling off of asset risk coupled with a marked increase in the average capital ratio brought the deposit insurance liability back to roughly its previous levels.

Whether the current level is still “too high” is, of course, a separate and important question, but compared to 1990 the more recent data do not suggest that the industry sits on the edge of a precipice. However, the conclusion would have been different in late 1990, especially if the alarming trends at that time had been projected into the future. The broader lesson from this episode may be that there are forces—market, regulatory, or other—at work within the current banking environment that act to correct excessive risk when it arises, nudging the industry away from disaster when it is at its most fragile.

Mark E. Levonian
Research Officer

References

Furlong, F. 1988. “Changes in Bank Risk-Taking.” Federal Reserve Bank of San Francisco *Economic Review* (Spring) pp. 45–56.

Levonian, M. 1991. “Have Large Bank Become Riskier? Recent Evidence from Option Prices.” Federal Reserve Bank of San Francisco *Economic Review* (Fall) pp. 3–17.

P.O. Box 7702
San Francisco, CA 94120

Research Department
Federal Reserve
Bank of
San Francisco

Index to Recent Issues of *FRBSF Weekly Letter*

DATE	NUMBER	TITLE	AUTHOR
11/6	92-39	Interest Rate Risk and Bank Capital Standards	Neuberger
11/13	92-40	NAFTA and U.S. Banking	Laderman/Moreno
11/20	92-41	A Note of Caution on Early Bank Closure	Levonian
11/27	92-42	Where's the Recovery?	Cromwell/Trenholme
12/4	92-43	Diamonds and Water: A Paradox Revisited	Schmidt
12/11	92-44	Sluggish Money Growth: Japan's Recent Experience	Moreno/Kim
12/25	92-45	Labor Market Structure and Monetary Policy	Huh
1/1	93-01	An Alternative Strategy for Monetary Policy	Motley/Judd
1/8	93-02	The Recession, the Recovery, and the Productivity Slowdown	Cogley
1/22	93-03	U.S. Banking Turnaround	Zimmerman
1/29	93-04	Competitive Forces and Profit Persistence in Banking	Levonian
2/5	93-05	The Sources of the Growth Slowdown	Motley
2/12	93-06	GDP Fluctuations: Permanent or Temporary?	Moreno
2/19	93-07	The Twelfth District Agricultural Outlook	Dean
2/26	93-08	Saving-Investment Linkages in the Pacific Basin	Kim
3/5	93-09	A Single Market for Europe?	Glick/Hutchison
3/12	93-10	Risks in the Swaps Market	Laderman
3/19	93-11	On the Changing Composition of Bank Portfolios	Neuberger
3/26	93-12	Interest Rate Spreads as Indicators for Monetary Policy	Huh
4/2	93-13	The Lonesome Twin	Throop
4/9	93-14	Why Has Employment Grown So Slowly?	Trehan
4/16	93-15	Interpreting the Term Structure of Interest Rates	Cogley
4/23	93-16	California Banking Problems	Zimmerman

The *FRBSF Weekly Letter* appears on an abbreviated schedule in June, July, August, and December.