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## Now and Then: The Evolution of Loan Quality for U.S. Banks

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*Although loan quality in the U.S. banking industry deteriorated in recent years, a comparison with the banking crisis of the late 1980s and early 1990s suggests that the industry is in a far better position today than it was a decade ago. The percentage of troubled loans is lower, loan quality problems are confined principally to large-bank commercial and industrial lending, and credit weakness is concentrated in a small number of borrower industries.*

The 1990s was a period of considerable success for the U.S. banking industry. As the economy surged, bank profits rose and the volume of problem loans declined. More recently, however, the 2001-02 recession,<sup>1</sup> industry-specific excesses, and international exposures have weakened bank balance sheets and led to an increase in the ratio of nonperforming loans to total loans (NPL ratio).<sup>2</sup>

This edition of *Current Issues* examines the decline in loan quality in the U.S. banking industry that took place from fourth-quarter 1999 to third-quarter 2002 and discusses its potential implications for the industry and the economy as a whole. We begin with a comparison to the banking crisis of the late 1980s and early 1990s and show that the recent increase in nonperforming loans is relatively modest. While this largely reflects the immense scale of the banking problems of the early 1990s, the quality of loans for the U.S. banking industry is clearly much better now than a decade ago.

Aggregate ratios, however, hide important variation across banks and loan types, so we also examine the per-

formance of specific lending segments. We show that the recent increase in the NPL ratio stems almost entirely from the lending activity of large banks, particularly their commercial and industrial (C&I) lending. In contrast, problem loans were more widespread across C&I and real estate lending for banks of all sizes in the early 1990s.

To shed light on the source of loan quality problems, we employ data from the 2002 Shared National Credit (SNC) Program to examine the performance of commercial loans in different borrower industries.<sup>3</sup> We find that loan quality problems in 2002 were concentrated more heavily in particular industries than they were in the early 1990s, suggesting that industry-specific problems and not broad macroeconomic trends were driving the recent run-up in nonperforming loans. The highest ratio of nonperforming loan commitments in 2002, for example, was found in the broadcast and telecommunications industry, which accounted for nearly one-quarter of the aggregate ratio.

We conclude that many factors make the recent deterioration in loan quality less of a threat to both the banking industry and the U.S. economy than the problems a decade

ago. First, the magnitude of the problem in 2002 was considerably smaller. Second, the industry is healthier, with a larger stock of loan-loss reserves and equity capital providing a buffer against future charge-offs. Third, the concentration of the problems in particular sectors reduces the risk of an economy-wide “credit crunch” and should allow bankers and supervisors to focus their attention on the troubled industries. Finally, the relatively strong loan quality shown by small and midsized banks limits the risk of a credit crunch for smaller firms, which are more likely than large firms to depend on loans from these banks.

### Comparing Loan Quality across Economic Slowdowns

To get a better sense of the magnitude of the recent deterioration in aggregate loan quality, we compare loan performance during the slowdown of the past few years with that during the slowdown of the early 1990s. Specifically, using data from the Consolidated Reports of Condition and Income (“Call Reports”) for all U.S. commercial banks, we compare the loan quality deterioration from fourth-quarter 1999 to third-quarter 2002 with the decline that occurred from fourth-quarter 1988 to second-quarter 1991.<sup>4</sup> We choose these two periods because each runs from the lowest level of the NPL ratio to the highest level for that recession.

A comparison of movements in the NPL ratio over the two periods shows that both the level and the increase in loan quality problems were smaller during the recent slowdown (Chart 1). Moreover, other calculations indicate that the U.S. banking industry was in much better financial condition

heading into the recent recession than in the early 1990s: banks had higher profits, capital, and loan-loss reserves. This improvement owes much to the strength of the economy and the regulatory focus on capital adequacy during the 1990s, but it also reflects the increased securitization that shifted some risk outside of banking and the absence of adverse shocks like those that hit the banking industry in the 1980s.<sup>5</sup>

While aggregate analysis provides a useful view of overall loan performance, it misses important differences across firms and business lines. These differences reflect key factors such as business practices, management ability, scale, and technology, as well as exposure to different economic and regional shocks.<sup>6</sup> The remainder of this section examines loan quality problems across bank size classes and loan types.

### Decomposing the Level of Loan Quality

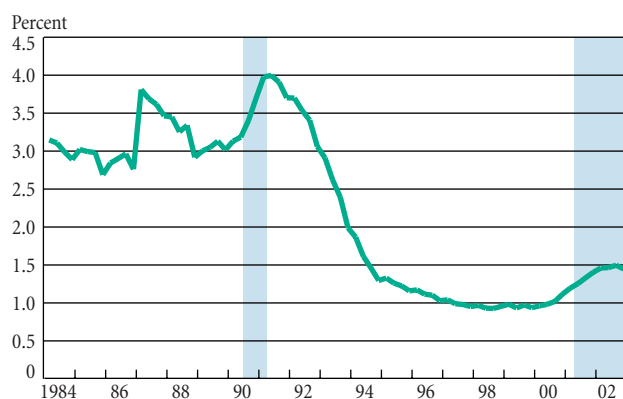
Any aggregate ratio can be rewritten as a weighted average of the ratio for subsets of institutions or types of loans. For example, the aggregate NPL ratio equals the weighted average of the NPL ratio across banks or loan types using loan shares as weights. Each share-weighted NPL ratio is called the “contribution to the level of the NPL ratio” and shows how important that set of loans is to the aggregate ratio.<sup>7</sup>

By calculating the contribution that each of the major types of loans—consumer, real estate, and commercial and industrial—has made to the level of the NPL ratio, we shed light on the sources of the aggregate loan quality decline during the 1990-91 and 2001-02 recessions (Chart 2).<sup>8</sup> Real estate lending emerges as the primary source of the decline in the early 1990s, while C&I lending has largely driven the more recent decline. An alternative decomposition of the NPL ratio by bank size—large, medium, and small—shows that recent loan quality problems derive almost entirely from the large banks, while medium and small banks also made substantial contributions in the early 1990s (Chart 3).<sup>9</sup> The decompositions are revealing in other ways: They show that C&I loans at large banks were already a problem before the 1990-91 recession, while the recent run-up in C&I nonperforming loans seems more cyclical. Finally, in addition to a higher aggregate NPL ratio in the early 1990s, the underlying data (not shown) indicate that loan quality was worse for most types of lending and size classes, which highlights the breadth of the earlier problems.

These differences reflect the divergent nature of the two economic slowdowns: The recession in the early 1990s was exacerbated by the developing-country debt crisis and overbuilt commercial real estate,<sup>10</sup> while the recent downturn was linked to the high-tech bust and large declines in business investment. For example, the NPL ratio for commercial real estate loans was 8.7 percent in the second quarter of

Chart 1

#### The Nonperforming Loan Ratio of the U.S. Banking Industry 1984:1 to 2002:4



Source: Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income.

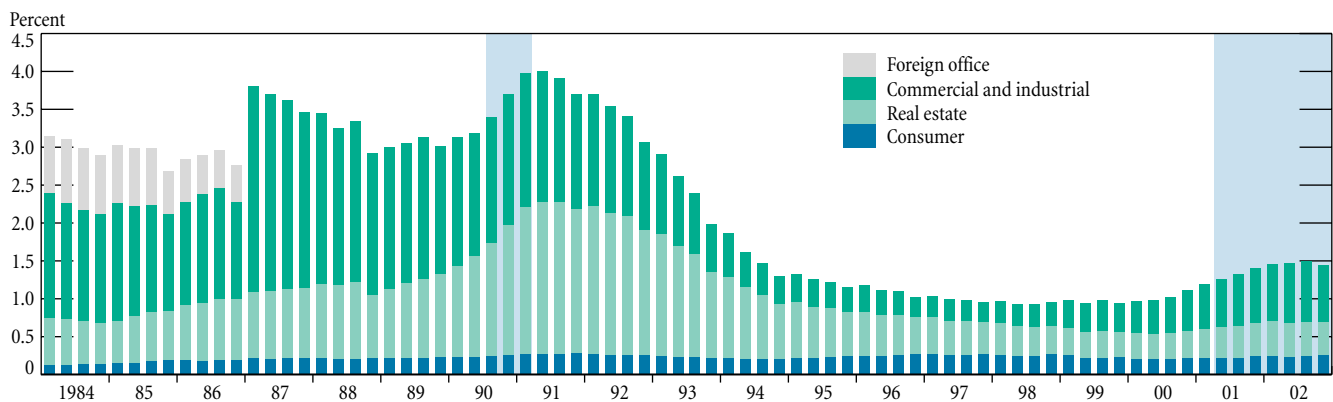
Notes: The nonperforming loan ratio is defined as aggregate nonperforming loans as a percentage of total loans. Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

1991, more than double that of the portfolio as a whole; in the third quarter of 2002, C&I lending had the highest NPL ratio of 2.3 percent while the commercial real estate NPL ratio was only 0.9 percent.

The fact that large banks have consistently driven the aggregate NPL ratio over the past two decades is not surprising, given that they dominate U.S. banking, but it is interesting to note that they typically have higher NPL ratios than their smaller competitors.<sup>11</sup> Moreover, the divergence in loan quality between large and other banks has increased in each of the last two recessions, with small banks experiencing almost no increase in their NPL ratios. One possible

explanation is that economy-wide recessions are not good indicators of the relevant shocks for small banks, which might be more affected by fluctuations in local lending markets. Alternatively, the generally worse loan quality of large banks could simply reflect more risk taking. Because large banks can diversify their portfolio more easily than small banks, they might accept riskier borrowers, price the risk accordingly, and accept the higher (but predictable) loan quality problems. Demsetz and Strahan (1997), for example, argue that diversification allows large banks to operate with higher leverage and hold riskier loans. Finally, large banks typically hold more unsecured debt than smaller ones and

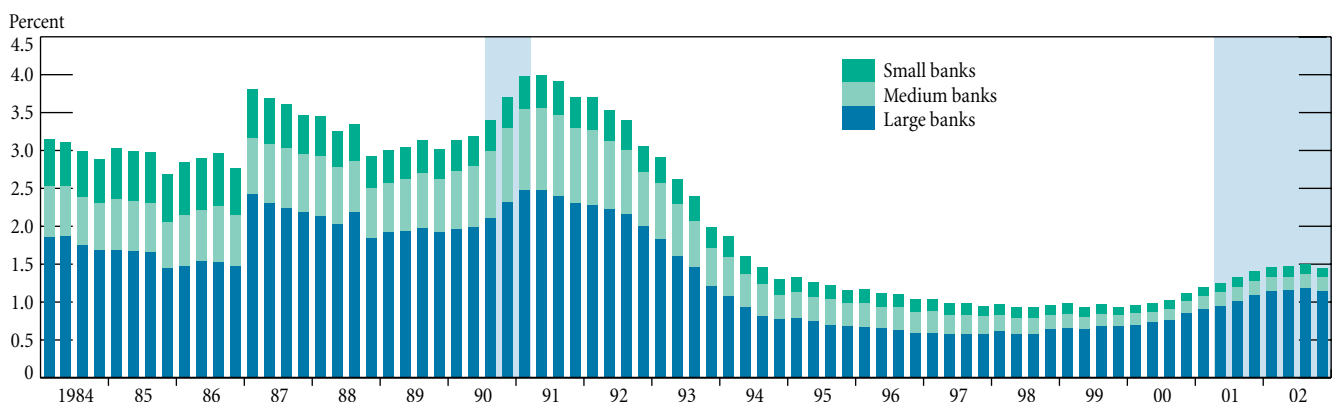
Chart 2  
Decomposition of the Nonperforming Loan Ratio by Major Loan Type, 1984:1 to 2002:4



Sources: Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income; authors' calculations.

Notes: The contribution of each loan type to the aggregate nonperforming loan (NPL) ratio equals the share-weighted NPL ratio of that loan type. Foreign office loans are broken out only for first-quarter 1984 to fourth-quarter 1986; after that period, they are classified by loan type. Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

Chart 3  
Decomposition of the Nonperforming Loan Ratio by Bank Size, 1984:1 to 2002:4



Sources: Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income; authors' calculations.

Notes: The contribution of each size class to the aggregate nonperforming loan (NPL) ratio equals the share-weighted NPL ratio of that group of banks. Small banks have assets less than \$500 million; medium banks, assets between \$500 million and \$10 billion; and large banks, assets greater than \$10 billion (all values are in constant 2002 dollars). Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

are therefore obliged to place a greater portion of their deteriorating loans in nonperforming status earlier.

### *Decomposing Changes in Loan Quality*

We now examine the sources of the changes in the industry NPL from fourth-quarter 1988 to second-quarter 1991 and from fourth-quarter 1999 to third-quarter 2002. We distinguish changes in loan quality *within* banks or lending lines from reallocations *between* banks or lending lines by calculating a “within effect” and a “reallocation effect.” The intuition is that the aggregate NPL ratio rises if either particular banks or loan segments show rising NPL ratios (the within effect) or if banks with relatively high NPL ratios increase market share (the reallocation effect).<sup>12</sup> Isolating these two effects clarifies the forces behind the rising loan quality problems in each period.

Our estimates suggest that deteriorating loan quality *within* individual institutions was the dominant force in both periods (see table, top panel). Focusing on the within effects, we break out our results by bank size and loan type (bottom panel). In 1999-2002, large banks were responsible for virtually all of the rise in the NPL ratio, while medium banks made a sizable contribution in the earlier period. Certainly, the importance of large banks in recent years was partly due to their growing market share, but that is not the whole explanation. During this period, the decline in loan quality was deeper and more rapid for large banks than for small.

Across types of loans, the story is also very different for the two periods. In the recent slowdown, C&I lending at large and medium banks was the primary source of the increase in the NPL ratio, while real estate lending made virtually no contribution. For the 1988-91 period, the picture is reversed: real estate lending dominated C&I lending.<sup>13</sup> For the large banks, the contribution of domestic C&I loans is comparable across the two periods, although foreign C&I loans were a much greater drag recently. The more modest contribution of foreign loans to the change in the NPL ratio over the earlier period reflects the fact that foreign banking problems associated with developing-country loans peaked in the late 1980s; the period from fourth-quarter 1988 to second-quarter 1991 actually represents an improvement in this area.

### **Loan Quality by Borrower for Large Banks**

To determine whether the C&I loan problems at large banks originate with a particular group of borrowers, we use data from the Shared National Credit Program. The SNC Program provides information on borrower industry as part of its annual review of large syndicated loan commitments.<sup>14</sup>

We aggregate the loan-level SNC data by borrower industry using the major industry groupings—those identified by two digits—in the North American Industry Classification System, or NAICS (OMB 1998). To isolate the high-tech industries, we then break out broadcasting and telecommunications (NAICS 513) and computers and electrical equipment (NAICS 334 and 335) from their larger industry groupings. These steps yield a total of twenty-two borrower industries. Our next step is to evaluate the credit quality of each of the twenty-two industries by calculating its nonperforming loan commitment (NPLC) ratio. We define nonperforming loan

### **Decomposition of Nonperforming Loan Growth during Periods of Loan Quality Deterioration** Percentage Points

	1988:4 to 1991:2	1999:4 to 2002:3
	Aggregate Decomposition	
Change in NPL ratio	1.08	0.56
Total “within effect”	0.95	0.66
Large banks	0.48	0.57
Medium banks	0.45	0.06
Small banks	0.02	0.03
Total “reallocation effect”	0.13	-0.10
Share effect	-0.10	0.00
Covariance effect	0.23	-0.10
	Decomposition of “Within Effect” by Bank Size	
Large bank “within effect”	0.48	0.57
Commercial and industrial—domestic	0.38	0.37
Commercial and industrial—foreign	-0.17	0.11
Consumer	0.03	-0.01
Total real estate	0.56	0.02
Other	-0.33	0.07
Medium bank “within effect”	0.45	0.06
Commercial and industrial—domestic	0.18	0.04
Commercial and industrial—foreign	0.00	0.00
Consumer	0.02	0.00
Total real estate	0.26	0.02
Other	-0.01	0.00
Small bank “within effect”	0.02	0.03
Commercial and industrial plus other	0.00	0.01
Consumer	0.00	0.00
Total real estate	0.01	0.02

Source: Federal Financial Institutions Examination Council, Consolidated Reports of Condition and Income.

Notes: A technical appendix to this article, available at [http://www.newyorkfed.org/rmaghome/curr\\_iss/ci9-4.html](http://www.newyorkfed.org/rmaghome/curr_iss/ci9-4.html), explains how the decomposition framework is derived. The periods in the table cover the change from the lowest level of the aggregate nonperforming loan (NPL) ratio to the highest level. The NPL ratio is defined as nonaccrual loans plus loans ninety days past due as a percentage of loans for each type and total. Small banks have assets less than \$500 million; medium banks, assets between \$500 million and \$10 billion; and large banks, assets greater than \$10 billion (all values are in constant 2002 dollars).

commitments to include commitments that are rated “doubtful” or “loss,” as well as 10 percent of those rated “substandard.” The NPLC ratio is computed as nonperforming loan commitments divided by total commitments, including both advanced and undrawn commitments.<sup>15</sup>

To highlight industries that have undergone a decline in credit quality, we plot the 2002 NPLC ratio of each industry against its 1991 ratio (Chart 4). Industries above the 45-degree line experienced an increase in their NPLC ratio, while industries below the line experienced a decrease. Each industry is represented as a circle whose size corresponds to that industry’s average loan commitment share across the two periods. Movements in the individual industry ratios can be compared with the change in the aggregate NPLC ratio, which fell from 2.6 percent in 1991 to 2.1 percent in 2002, and with the change in the median NPLC ratio, which fell from 2.0 percent to 1.4 percent.

Although the majority of borrower industries show better credit quality in 2002 than in 1991, some industries saw their credit problems worsen. Most notably, the broadcasting and telecommunications industry accounts for almost one-quarter of the aggregate NPLC ratio in 2002. Its NPLC ratio for that year is 7.7 percent, which is sharply higher than its 1991 ratio of 1.8 percent and nearly four times the 2.1 percent aggregate ratio in 2002. Other industries with high current

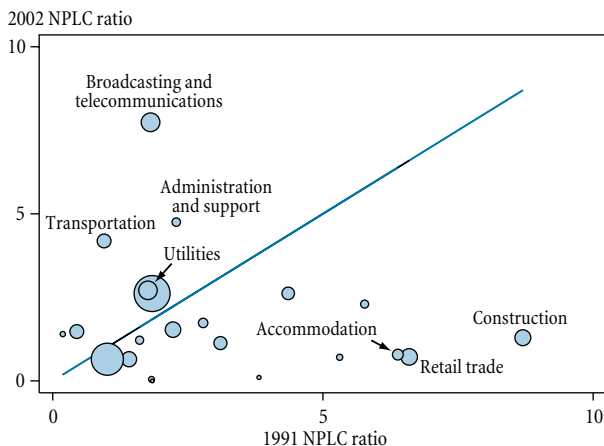
ratios and large increases since 1991 are administration and support, transportation, and utilities. In 1991, by contrast, the industry with the lowest credit quality was construction. With an NPLC ratio of 8.7 percent, this industry accounted for nearly one-quarter of the aggregate ratio. Other weak performers in 1991 included retail trade and accommodation. This comparison points to a substantial shift away from real-estate-related industries as the source of borrower credit problems.

To complete our analysis, we examine the degree to which loan quality problems are concentrated in specific borrower industries. The distribution of the problems can give some insight into the sources of the decline in credit quality and has implications for the availability of credit. Credit weaknesses that are highly concentrated in particular industries are more likely to reflect industry-specific problems such as excess capacity or negative supply shocks, while macroeconomic conditions are more likely to be the culprit if all industries show weakness. This difference is important because it is less likely for industry-specific problems to lead to an overall restriction of credit if bankers can identify the problem areas and reallocate credit accordingly.

We first compare each industry’s NPLC ratio with the economy-wide NPLC ratio. In 2002, only seven of the twenty-two industries posted NPL ratios above the aggregate, while eleven of the twenty-two were above the aggregate in 1991—a finding that suggests greater concentration today. Using the industry contribution in 1991 and 2002, we then calculate a variant of the Hirschman-Herfindahl Index (HHI), a tool used to measure concentration, to evaluate the concentration of loan quality problems. The HHI across three-digit NAICS industries was higher in 2002—further evidence that loan quality problems are more concentrated today.<sup>16</sup>

The difficulties in telecommunications deserve some discussion because of the large concentration of loan quality problems in this sector. The Telecommunications Act of 1996 fostered increased competition between local and national companies, which—reinforced by lofty predictions of rapidly increasing Internet traffic—led telecom firms to invest heavily and borrow extensively from commercial banks and the bond market. Standard and Poor’s, for example, estimated that U.S. banks have made \$60 billion in loans to telecom firms in the past few years (Mandaro 2002). Bank lending to the industry has proved to be a problem: telecommunications defaults have been rising steadily since 1999 as firms struggle to finance their heavy debt burdens. To deal with their loan quality problems, banks have been selling the riskier portions of their loan portfolios

Chart 4  
Change in U.S. Industries’ Share-Weighted Nonperforming Loan Commitment Ratios, 1991-2002



Sources: Shared National Credit Program data; authors’ calculations.

Notes: Each industry is represented by a circle whose size corresponds to that industry’s loan commitment share, averaged across 1991 and 2002. Those industries above the 45 degree line experienced a rise in their nonperforming loan commitment (NPLC) ratios, while those below the line experienced a decline. The NPLC ratio of each industry is defined as the sum of all loan commitments classified “doubtful” or “loss” and 10 percent of those classified “substandard” expressed as a percentage of the industry’s total commitments.



(Julavits and Boraks 2002). Moreover, loan volume, particularly C&I lending, decreased during 2001.

This pullback in credit is also evident in the nonfinancial commercial paper market, where volume has undergone a 40 percent drop since the end of 2000 (Kwan 2002). Issuance also declined for high-yield bonds, and speculative spreads have risen. Through August of 2002, new high-yield issues were down 31 percent by volume from the same period in 2001 (O'Leary 2002). Much of the decline in activity can be traced to the telecom sector, which accounted for 70 percent of the total value of bond defaults in the first half of 2002 (Schmelkin 2002).

While these facts indicate that a tightening of credit is under way, economy-wide credit restrictions seem unlikely. Total business debt has actually increased over the past two years even as bank loan volume has decreased; nonbank lenders have filled the gap left by traditional banks (Kwan 2002). In addition, the Federal Reserve's Senior Loan Officer Opinion Survey (Board of Governors of the Federal Reserve System 2002b) suggests that the greater part of the decline in C&I loan volume for commercial banks is due to decreased demand as the economy has weakened, rather than to tighter credit standards and a decline in loan supply. This evidence suggests that the reduction in credit is largely concentrated in problem industries, where the tightening is a natural result of borrowers' decreased ability to repay.

One final possible concern is that the large banks that lent to these companies may have fewer loss-mitigating tools at their disposal. Since many of these now-troubled loans were to companies that were originally good credits (termed "fallen angels" in the bond market), they were made without strong collateral or protective covenants. As a result, banks are likely to have difficulty collecting on the bad debt and may face higher charge-offs in the future.

## Conclusions

Our analysis of loan quality trends reveals significant differences between the recent deterioration in loan quality and the decline that took place a decade ago. Most important, both the level and the increase in loan quality problems were substantially smaller in 2002 than during the banking crisis of the late 1980s and early 1990s. Moreover, the core of industry problems has shifted from real-estate-related lending in medium and large banks to commercial and industrial lending in the largest banks. The decline in credit quality is now more narrowly confined to a small number of industries, particularly the telecommunications industry. Of course, macroeconomic conditions such as a "double-dip" recession, increased uncertainty about national security and geopolitical events, global weakness, and concerns over further corporate scandals

could lead to increased credit problems in the future, but the current picture suggests relatively healthy loan quality.

These conclusions have several implications for the U.S. banking industry and the economy. In 1991, for example, some argued that a credit crunch exacerbated the economic decline. The relative strength of loan quality at small banks and the concentration of large banks' loan problems in specific industries, however, suggest that a small-bank credit crunch is less likely now. Some high-risk firms may experience difficulty in obtaining credit in any market, but this is a normal result of well-functioning credit markets.

A second issue relates to bank profits. Because loan quality problems are an indicator of future banking profitability, our results suggest that profitability may diverge across banks. Bassett and Brady (2001) have shown that the return on assets was comparable for large and small banks from 1985 to 2000.<sup>17</sup> If the divergence in loan quality ratios documented here foreshadows profitability trends, it may be reasonable to expect small banks' profits to rise relative to those of large banks in the near term.

As a final point, we emphasize that this study has focused entirely on the credit risk associated with the quality of on-balance-sheet lending and off-balance-sheet loan commitments. This risk is, of course, only one component of bank risk. As banks enter new business lines and offer new products, they are facing new risks. We have not examined trading, operational, or market risk, or compared the past and present health of other bank activities. Thus, our main conclusion about the relative strength of the U.S. banking industry in 2002 applies only to traditional lending activities.

## Notes

1. The National Bureau of Economic Research has not yet assigned an ending date to the recession that began in March 2001. For ease of reference in this article, we term this recession the 2001-02 recession.
2. The NPL ratio is defined as nonperforming loans—nonaccrual loans plus loans ninety days or more past due—as a percentage of total loans. Nonaccrual loans are those not earning the contractual rate of interest because the full collection of principal is in doubt or because interest payments have not been made. The NPL ratio is our primary indicator of loan quality problems.
3. The SNC Program is maintained jointly by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency. For more information about the program, see Board of Governors of the Federal Reserve System (2002a).
4. Note that the NPL ratio fell in fourth-quarter 2002, but this comparison stops in third-quarter 2002.
5. The 1980s and early 1990s marked a period of particularly severe loan quality problems because of extraordinary regulatory and competitive pressures: for example, deregulation of interest rates and interstate banking, real estate lending problems, disintermediation, the crisis in developing-country loans, and oil price shocks. See FDIC (1997) for details.

6. See Haltiwanger (1997) for details from manufacturing and Stiroh (2000) for details from banking.

7. A technical appendix with the derivation and detailed estimates is available at <[http://www.newyorkfed.org/rmaghome/curr\\_iss/ci9-4.html](http://www.newyorkfed.org/rmaghome/curr_iss/ci9-4.html)>.

8. From first-quarter 1984 to fourth-quarter 1986, Call Report data include a fourth category—"foreign office loans"; these cannot be consistently allocated by loan type. C&I loans include the "all other loan" category because the Call Reports do not break out the C&I nonperforming loans for small banks.

9. Small banks are defined as those with assets less than \$500 million, medium banks as those with assets between \$500 million and \$10 billion, and large banks as those with assets greater than \$10 billion. All figures are in 2002 dollars.

10. See Browne and Rosengren (1993).

11. Large banks held 47.2 percent of loans in second-quarter 1991 and 69.8 percent in third-quarter 2002, while medium banks held 32.7 percent and 17.3 percent and small banks held 20.3 percent and 12.9 percent, respectively.

12. Details are in the technical appendix.

13. For the C&I contribution, we include only large and medium banks whose C&I NPL ratios can be broken out.

14. The SNC Program's review covers all loan commitments of at least \$20 million that are shared by three or more financial institutions (two or more prior to 1999). The data include information on the value of total loan commitments and the amount drawn down (advanced). Included are commitments for commercial real estate, commercial and industrial loans, and off-balance-sheet commitments made by U.S. commercial banks.

15. The correlation between the NPL ratio of large bank C&I loans and the NPLC ratio from SNC for 1989 to 2002 is 0.91 in levels and 0.82 in growth rates. We chose to include 10 percent of substandard loans in our definition of nonperforming loan commitments in order to reconcile the Call Report data with the SNC data, but altering this percentage does not materially change the results. We obtain essentially the same results whether we use the entire committed loan amount or only the outstanding balances.

16. We use data for ninety-five three-digit NAICS industries (not shown) to calculate the HHI in each year. More precisely, we create a ratio of the industry contribution to total NPLCs, multiply by 100, square the ratio, and sum over all industries. A higher HHI indicates a more concentrated distribution of loan quality problems.

17. The return on equity of large banks, however, has generally exceeded that for small banks because the large banks are typically more leveraged.

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