BANKING SECTOR PERFORMANCE DURING TWO PERIODS OF SHARPLY HIGHER INTEREST RATES: 2022 AND 2004 TO 2006

OVERVIEW

Interest rates rose dramatically in 2022, causing an abrupt shift in banking conditions. The increase in the federal funds target rate in 2022 was the largest and fastest since the 1980s and followed an extended period of low interest rates. Intermediate and longer-term rates also rose but at a slower pace, causing the yield curve to rise and invert. Interest rates affect banks through earnings, lending, funding costs, and the fair value of assets. This article examines the increase in interest rates in 2022 and compares the resulting changes in banking outcomes with changes that occurred during 2004 to 2006 (2004 cycle), when interest rates rose by nearly the same magnitude.

In 2022, banks benefited from an initial boost to net interest income provided by increasing interest rates, but challenges relative to decelerating loan growth, increased funding costs, and decreased liquidity became more evident by first quarter 2023. Banks benefited from higher rates in the 2004 cycle but to a smaller degree, and were also challenged by decelerating growth of loans and deposits and decreased fair value of assets and liquidity. While the effects of higher interest rates on banking outcomes generally followed a similar pattern in both cycles, the effects have been somewhat more pronounced in the current cycle, for reasons described in this article. The sharply higher interest rates in 2022 strained certain banks, as highlighted by severe liquidity strains and the bank failures in March and May of 2023.

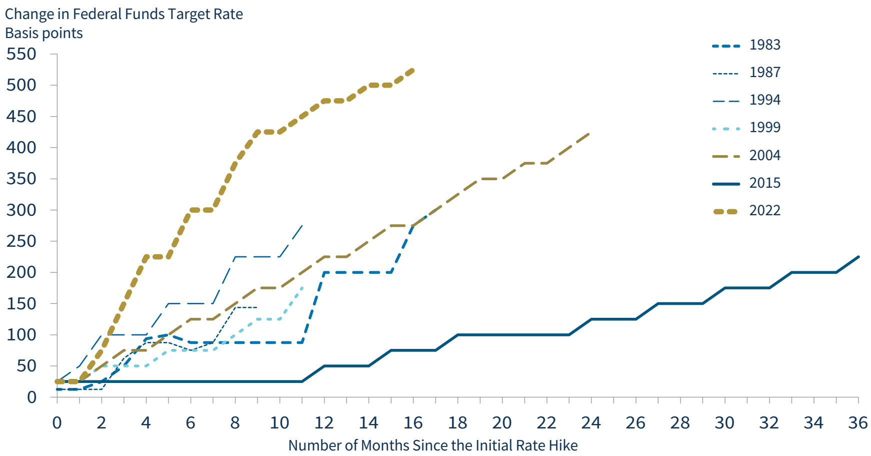
INTEREST RATE DEVELOPMENTS

After a prolonged period of historically low interest rates, interest rates rose dramatically in 2022. From March to December 2022, the Federal Open Market Committee (FOMC) raised the federal funds target rate 425 basis points, the fastest pace of tightening since the early 1980s. Medium- and longer-term rates also rose. The ten-year Treasury yield rose from 1.63 percent to 3.88 percent in 2022. Short-term rates rose faster than longer-term rates, causing the yield curve to invert, with the two-year yield exceeding the ten-year yield by the widest margin since 1981.

The 2004 cycle was the most recent cycle with a relatively large increase in interest rates and offers a basis for comparing interest rate effects on bank performance over time. In the 2004 cycle, the federal funds target rate increased by a similar magnitude but more gradually, over a period of 24 months. Like the 2022 cycle, the 2004 cycle also followed a period of low interest rates.[1] After the sharp increases in interest rates in the 2004 cycle, interest rates fell to historically low levels and the 2015 rate hike cycle that followed was lower and more gradual (Chart 1).

Chart 1

Interest Rates Rose More Sharply in 2022 Than in Previous Cycles



Source: Federal Reserve Board (Haver Analytics).
Note: Data as of July 2023. The cumulative change in the federal funds target rate is the difference between the rate at a given month compared to the month before the rate hike.

[1] In July 2003, the effective federal funds rate declined to 1.01 percent, its lowest level in 45 years. In June 2003, the Federal Home Loan Mortgage Corporation 30-year conventional mortgage rate fell to 5.21 percent, the lowest rate up until June 2003 in the history of the Primary Mortgage Market Survey. See FDIC, *Crisis and Response: An FDIC History, 2008–2013*, November 30, 2017, https://www.fdic.gov/bank/historical/crisis/crisis-complete.pdf.

Higher interest rates affect bank loan growth, revenue, funding costs, deposit growth, and the fair value of assets.[2] This article examines trends in these variables during two periods of rising rate cycles: the one that began in 2022, and the 2004 cycle, the rate hike cycle most comparable to 2022 in magnitude.[3] Banking outcomes in the two periods were compared with outcomes in the year before, 2003 and 2021. The analysis also includes comparisons to ten-year averages through 2021 to provide a longer-term comparison of the value of these variables during a period of lower interest rates.[4] The trends reflect medians of the values banks reported in Consolidated Reports of Condition and Income (Call Reports), unless otherwise noted, to understand effects on a "typical" bank not captured in averages and to understand aggregates that are skewed by larger banks and outliers.

LOAN GROWTH

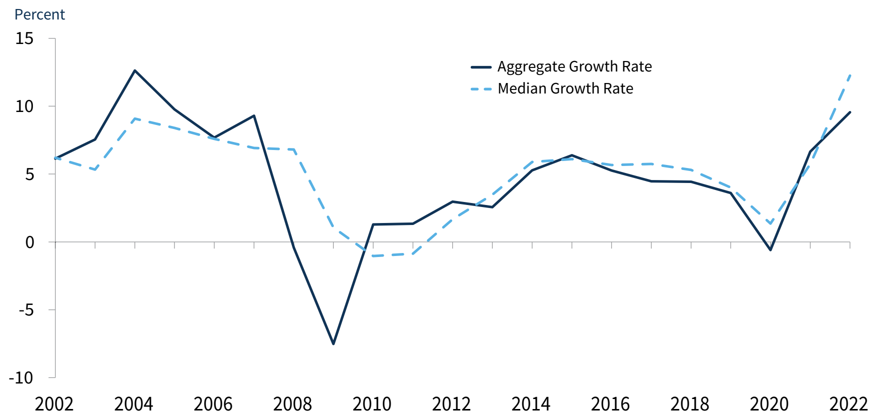
Loan growth reflects a variety of factors, including economic conditions, interest rates, and bank underwriting standards. The relative importance of these factors, and the effects on loan supply and demand, are difficult to determine separately.[5] Interest rate tightening cycles are generally a response to inflationary pressures that may be associated with especially strong economic conditions. Strong economic conditions are also generally supportive of loan growth and may contribute to loan growth even as interest rates begin to rise, at least initially. Eventually, higher interest rates tend to slow economic conditions and reduce loan affordability, which lowers demand for loans and leads to tighter underwriting standards that reduce the supply of loans.

[2] "Banks" are all FDIC-insured filers of Consolidated Reports of Condition and Income (Call Reports), both commercial banks and savings institutions.
[3] The federal funds target rate rose 425 basis points in 2022 and in the 2004 cycle.
[4] Unless otherwise noted, balances or ratios are as of December 31 of each year. Banking outcomes expressed as year-over-year growth rates or changes for median banks are based on bank level data adjusted for mergers over the one-year period. Banking outcomes expressed as ratios for median banks do not need merger adjustment. Share counts include only banks that existed in both reporting periods. The ten-year average refers to the period 2012 to 2021.
[5] Kenneth N. Kuttner and Patricia C. Mosser, "The Monetary Transmission Mechanism: Some Answers and Further Questions," FRBNY Economic Policy Review, May 2002, https://www.newyorkfed.org/medialibrary/media/research/epr/02v08n1/0205kutt.pdf.

Loan growth was initially resilient during both periods of rising interest rates, even after adjusting for loans made under the Paycheck Protection Program (Chart 2).[6] Despite the larger increase in short-term interest rates, the median loan growth rate was significantly higher in 2022 than in 2021 and the ten-year average (Table 1). The median loan growth rate was 12.3 percent in 2022, the second-highest median loan growth rate since 1984. The 2022 median loan growth was more than double the median loan growth rate of 5.7 percent in 2021 and the ten-year average median loan growth rate of 4.5 percent. All but the largest banks had higher median loan growth rates in 2022 than in 2021, and only 10.0 percent of banks reported no loan growth in 2022.

Chart 2

Loan Growth Was Resilient During the 2004 to 2006 and 2022 Rising Interest Rate Cycles



Source: FDIC.
Note: Data as of fourth quarter 2022. Total loans excludes balances from the Paycheck Protection Program. Growth rate is calculated as the annual change in balance as of December 31 of each year. Median growth is adjusted for mergers.

Table 1

Loan Growth Strengthened During 2004 to 2006 and in 2022

Median Annual Total Loan Growth (Percent)

	2003	2004 to 2006	2012 to 2021	2021	2022
Industry	5.3	8.4	4.5	5.7	12.3
Asset Size Groups					
Greater Than $250 Billion	5.1	7.9	3.7	7.5	6.8
$10 Billion to $250 Billion	8.1	10.7	6.5	5.6	13.0
$1 Billion to $10 Billion	8.3	11.8	7.5	8.3	15.6
$100 Million to $1 Billion	7.1	9.9	4.8	6.1	12.4
Less Than $100 Million	3.2	6.0	1.8	1.3	6.4

Source: FDIC.
Note: Total loans excludes balances from the Paycheck Protection Program. Growth rate is calculated as the annual change in balance as of December 31 of each year, adjusted for mergers. Simple average is calculated for multiple years.

[6] Total loans and commercial and industrial (C&I) loans exclude balances from the Paycheck Protection Program (PPP) which temporarily boosted loan growth. The PPP was implemented in 2020 and ended in 2021 and provided low-cost, forgivable loans to qualifying small businesses to help cover payroll costs, interest on mortgages, rent, and utilities during economic dislocation caused by the COVID-19 pandemic. Including PPP loan balances, the median total loan growth rate was 6.2 percent in 2020, 2.0 percent in 2021, and 11.1 percent in 2022. Excluding PPP loan balances, the median total loan growth rate was 1.4 percent in 2020, 5.7 percent in 2021, and 12.3 percent in 2022.

Strong labor markets and high inflation in 2022 may have helped support loan growth. Despite an economic slowdown and higher interest rates in 2022, inflation continued to rise and reached multi-decade highs. Higher prices for items that typically are financed by banks may increase the amount that the customer needs to borrow. The labor market remained strong and personal incomes continued to grow, even as other sectors of the economy such as housing began to slow. Loan growth remained strong over the year, even as loan demand started to weaken later in 2022, according to the Federal Reserve Senior Loan Officer Opinion Survey on Bank Lending Practices (loan officer survey).[7]

As the economy grew at a slower pace and the lagged effects of higher interest rates further dampened economic conditions, loan growth began to soften in 2023. In aggregate, loans grew 0.4 percent between fourth quarter 2022 and first quarter 2023, though loan growth was more resilient for the median bank.[8] The slowdown in lending may reflect caution from banks.[9] In the April 2023 loan officer survey, banks reported tightening lending standards and noted concerns about funding costs, liquidity positions, and deposit outflows as reasons for expecting to tighten lending standards over the rest of 2023.[10]

Similar to the 2022 rate hike cycle, loans grew during the initial stage of the 2004 cycle and then decelerated toward the end. Economic conditions strengthened in 2004 from the previous year, with stronger economic growth and a lower unemployment rate. With these strong economic conditions, median loan growth strengthened. Economic conditions and loan growth early in the 2004 cycle reflected a housing boom during the mid-2000s, characterized by rapid credit expansion. Lending conditions cooled as interest rates rose and the housing market began to slow as house prices, as measured by the S&P CoreLogic Case-Shiller Home Price Index, declined.[11]

[7] Board of Governors of the Federal Reserve System, October 2022 loan officer survey, November 7, 2022, https://www.federalreserve.gov/data/sloos/sloos-202210.htm.

[8] This figure represents aggregate loan growth after adjusting for loans transferred out of the banking system to the FDIC resulting from two bank failures. See the *FDIC Quarterly* vol. 17 no. 2 for more details, https://www.fdic.gov/analysis/quarterly-banking-profile/qbp/2023mar/qbp.pdf#page=1.

[9] "Loan Growth Accelerates as Bankers Note Caution for Rest of 2022," Federal Reserve Bank of San Francisco SF Fed Blog, October 6, 2022, https://www.frbsf.org/our-district/about/sf-fed-blog/loan-growth-accelerates-bankers-note-caution-for-2022/.

[10] Board of Governors of the Federal Reserve System, April 2023 loan officer survey, May 8, 2023, https://www.federalreserve.gov/data/sloos/sloos-202304.htm.

[11] Home prices, as measured by the S&P CoreLogic Case-Shiller Home Price Index, peaked in July 2006 and then began to decline. S&P Dow Jones Indices LLC, S&P/Case-Shiller U.S. National Home Price Index, retrieved from FRED, Federal Reserve Bank of St. Louis, July 12, 2023, https://fred.stlouisfed.org/series/CSUSHPINSA; Board of Governors of the Federal Reserve System, "FOMC Statement," press release, August 8, 2006, https://www.federalreserve.gov/newsevents/pressreleases/monetary20060808a.htm.

Loan growth varied by loan category during both interest rate cycles, and business loans demonstrated higher growth. In 2022, median loan growth in commercial and industrial (C&I) loans was higher than in other categories (Table 2). Median consumer loan growth was led by credit card lending despite higher interest rates as consumer spending grew, in part reflecting higher expenditures from high inflation. With the exception of agricultural loans, loan growth was robust across all major loan portfolios.

In contrast, median growth in consumer loans declined in the 2004 cycle. High consumer debt burdens potentially weighed on consumer loan growth, which was much weaker during the 2004 cycle, while recovering business conditions early in 2004 may have helped C&I and nonfarm nonresidential lending.[12] Holdings of 1–4 family residential mortgages grew despite the declines in mortgage markets in both periods (box on page 51).

Table 2

While Business and Residential Real Estate Loans Led Growth in 2004 to 2006, Loan Growth Was Broad Based Across Industries in 2022

Median Annual Loan Growth Across Industry Loan Portfolios (Percent)

	2003	2004 to 2006	2012 to 2021	2021	2022
Commercial and Industrial	5.1	8.1	3.9	7.0	13.1
1–4 Family Residential	–0.5	4.9	2.0	1.4	12.7
Nonfarm Nonresidential	12.0	10.5	4.6	6.8	10.4
Agricultural	–4.2	2.4	0.8	–3.6	0.4
Consumer	–5.0	–1.1	–1.4	0.5	5.9
Credit Card	–1.3	0.0	–0.7	3.6	5.8
Other Consumer	–5.6	–1.4	–2.8	–2.9	3.9

Source: FDIC.
Note: Commercial and Industrial loans excludes balances from the Paycheck Protection Program. Growth rate is calculated as the annual change in balance as of December 31 of each year, adjusted for mergers. Simple average is calculated for multiple years.

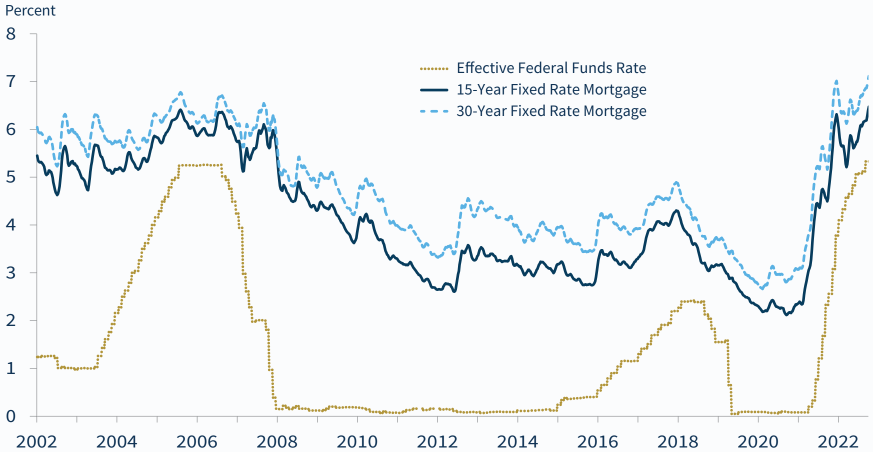
[12] Sally Kearney, "A Market Perspective on Banks' 2004 Outlook," FDIC, March 8, 2004, https://www.fdic.gov/news/events/roundtables/bioutlook_summary.html.

HIGHER INTEREST RATES WEAKENED HOUSING MARKET CONDITIONS DURING BOTH CYCLES

Housing is highly sensitive to interest rates, and higher interest rates slowed housing markets during both interest rate cycles. Mortgage rates rose substantially in 2022, with fixed-rate mortgages increasing more than market interest rates. According to the Federal Home Loan Mortgage Corporation, mortgage rates for 1–4 family homes more than doubled between 2021 and 2022 (Chart 3).

Chart 3

Mortgage Rates Rose Sharply in 2022



Sources: Federal Home Loan Mortgage Corporation and Federal Reserve Board (Haver Analytics).
Note: Mortgage rate data are weekly as of August 31, 2023, and are calculated as a four-week moving average. Effective federal funds rate data are monthly as of August 2023.

While mortgage interest rates were generally higher in 2004 than in early 2022, the increase during the 2004 cycle was much less pronounced. Mortgage rates entering 2004 were above 5 percent for both 15- and 30-year mortgages, more than 2 percentage points higher than early 2022 levels. In contrast to the rapid increase in mortgage interest rates in 2022, mortgage rates generally did not increase more than a percentage point by 2006, at the end of the 2004 cycle.

Higher mortgage rates in 2022 may reflect several factors. In addition to raising policy rates, the Federal Reserve began to reduce purchases of mortgage-related securities in 2022, which further tightened conditions in the market.[13] This contrasts to the monetary policy tightening during the 2004 cycle, when the Federal Reserve's balance sheet did not contain agency mortgage-backed securities. In addition, the spread between mortgage rates and long-term Treasuries have risen from the historic range, in part reflecting higher economic uncertainty.[14]

As mortgage rates rose, mortgage originations fell 50.1 percent for both banks and nonbanks in 2022 and bank originations declined 51.6 percent, according to Inside Mortgage Finance.[15] Despite the decline in originations, banks reported growth in 1–4 family residential mortgage balances. The strong rise in mortgage loans may reflect that banks may be holding more residential loans.[16] Mortgages originated when interest rates were low would have a lower value when interest rates rose, reducing the incentive for banks to sell them. Mortgage sales declined 65.9 percent in 2022.

Similarly, the mortgage market slowed and mortgage originations declined in the mid-2000s after a period of strong growth. Mortgage originations were down 22.3 percent between year-end 2003 and 2006, according to Inside Mortgage Finance.[17] More broadly, the decline in the mortgage market during the mid-2000s followed a period of unusually strong market growth and reflected factors other than higher interest rates that contributed to a housing market correction.[18] These factors did not contribute to housing market conditions in 2022.

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[13] Federal Reserve Board of Governors, "Plans for Reducing the Size of the Federal Reserve's Balance Sheet," news release, May 4, 2022, https://www.federalreserve.gov/newsevents/pressreleases/monetary20220504b.htm.

[14] Wendy Edelberg and Noadia Steinmetz-Silber, "High Mortgage Rates Are Probably Here for a While," Brookings Institution Commentary, June 8, 2023, https://www.brookings.edu/articles/high-mortgage-rates-are-probably-here-for-a-while/#:~:text=Nonetheless%2C%20to%20compensate%20investors%20for,rates%20have%20risen%20as%20well.

[15] Inside Mortgage Finance, 2023. Used with permission, https://www.insidemortgagefinance.com/.

[16] See the Housing Section of the 2023 Risk Review, FDIC, August 14, 2023, https://www.fdic.gov/analysis/risk-review/2023-risk-review.html.

[17] Inside Mortgage Finance.

[18] Factors include excess inventory, loose credit, high leverage, and more market speculation. See *Crisis and Response*.

INCOME

Higher interest rates in the 2004 cycle and in 2022 contributed to sharply higher net interest income. In 2022, strong loan growth and a sharp rise in interest rates caused median net interest income growth to rise to 10.2 percent, the fourth-largest median net interest income growth since 1984 (Table 3). This growth was nearly double the median growth of 6.1 percent in 2021 and more than double the ten-year average median growth of 3.7 percent. All asset size groups reported robust growth greater than in 2021 and greater than the ten-year average. Only 17.6 percent of banks did not report net interest income growth in 2022. Larger banks had higher net interest income growth likely due to their lower share of longer-term loans with contractual interest rates that did not reprice upward as market interest rates increased.[19] The median net interest income growth continued to increase and the year-over-year growth rate increased to 17.9 percent in first quarter 2023. Similarly, net interest income growth rose during the 2004 rising rate cycle. The median growth rate of net interest income was 6.2 percent during that cycle, more than double the median growth rate of 2.5 percent in 2003.

Table 3

Net Interest Income Rose for Banks Across Asset Size Groups in 2004 to 2006 and in 2022

Median Annual Growth in Net Interest Income (Percent)

	2003	2004 to 2006	2012 to 2021	2021	2022
Industry	2.5	6.2	3.7	6.1	10.2
Asset Size Groups					
Greater Than $250 Billion	2.8	7.0	0.8	–4.2	25.7
$10 Billion to $250 Billion	1.4	7.2	5.5	2.6	18.8
$1 Billion to $10 Billion	2.8	9.3	6.2	8.7	13.7
$100 Million to $1 Billion	3.5	7.5	4.0	6.7	9.3
Less Than $100 Million	1.5	4.4	1.3	1.5	6.9

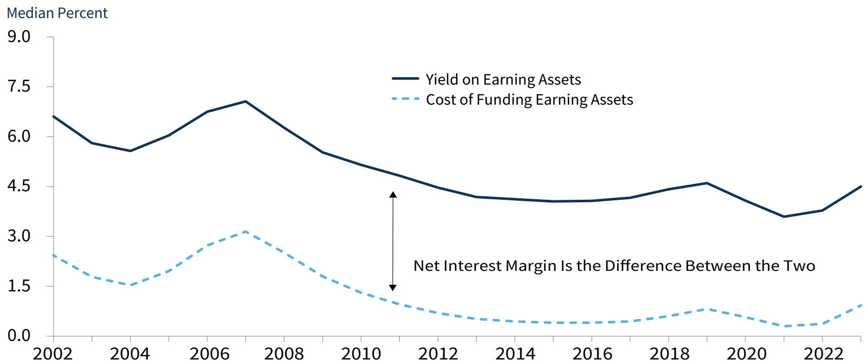
Source: FDIC.
Note: Net interest income is the difference between interest income and interest expense. Growth rate is calculated as the annual change in balance as of December 31 of each year, adjusted for mergers. Simple average is calculated for multiple years.

[19] Longer-term loans for purposes of this discussion are those with maturities greater than three years. Banks in the largest asset size group had a median longer-term-loans-to-assets ratio of 13.0 percent in 2021, significantly lower than the median ratio of 31.6 percent for all banks. Conversely, banks in the largest asset size group had a median longer-term-loans-to-assets ratio of 15.7 percent in 2003, similar to the median ratio of 17.0 percent for all banks.

While higher interest rates support interest income, the effects of higher interest rates on Net Interest Margin (NIM), which represent bank earnings from asset yields net of funding costs, are theoretically ambiguous. NIM tends to follow the direction of short-term interest rates, but NIM is influenced by many factors including asset maturity and repricing, balance sheet composition, and prevailing interest rates.[20] Both asset yields and cost of funds typically rise as interest rates rise, and typically follow the same pattern (Chart 4).

Chart 4

Yield on Assets and Cost of Funds Increased in Both the 2004 to 2006 and 2022 Rising Rate Cycles



Source: FDIC.
Note: Data as of first quarter 2023. For 2002 to 2022, yield on assets is calculated as the full-year interest income divided by the five-quarter average earning assets; cost of funds is calculated as the full-year interest expense divided by the five-quarter average earning assets. For 2023, yield on assets is calculated as the quarterly annualized interest income divided by the two-quarter average earning assets; cost of funds is calculated as the quarterly annualized interest expense divided by the two-quarter average earning assets.

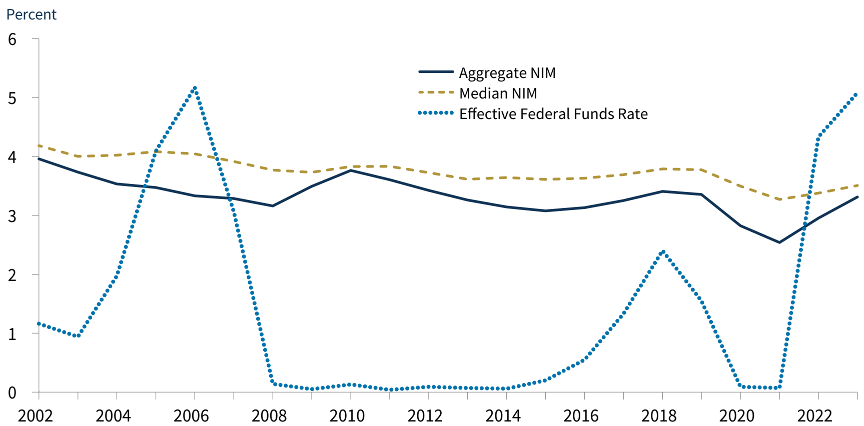
Net interest income is the primary revenue source for most banks, and banks tend to increase interest rates for loans faster than they increase the interest rates paid on deposits. Higher rates may support bank NIM in the short run, but banks may eventually have to pay more to retain deposits. An inverted yield curve could weigh on NIM over time as higher short-term interest rates drive up funding costs while lower longer-term rates keep yields on loans and other longer-term assets down. Higher rates could also weigh on net interest income and NIM if funding costs rise but banks are unable to extend loans at higher rates due to weak loan demand.

[20] For a discussion of other determinants of bank profitability, see Angela Hinton and Chester Polson, "The Historic Relationship Between Bank Net Interest Margins and Short-Term Interest Rates," *FDIC Quarterly* 15 no. 2 (2021): 31–41, https://www.fdic.gov/analysis/quarterly-banking-profile/fdic-quarterly/2021-vol15-2/article1.pdf.

The trends for NIM varied between the two rate hike cycles. NIM for the industry as a whole was higher in the 2004 cycle than in 2022 (Chart 5). However, NIM generally decreased during the 2004 cycle, as the increase in funding costs generally outweighed the increase in yield on assets. The relatively large increase in NIM in 2022 reflects sharply higher interest rates and follows a period during which NIM was much lower. NIM had generally been on the decline for years before reaching record lows in 2021.[21] Since interest rates remained generally low and deposits were relatively stable, bank funding costs remained stable, while low rates kept asset yields low. Toward the end of 2022, bank deposit rates fell farther below market rates than in previous periods, as discussed in more detail later in this article. As interest rates rose sharply in 2022, NIM grew at a relatively fast pace (Chart 6). Relatively low deposit rates enabled NIM to rise even as short-term market interest rates rose sharply and the yield curve inversion steepened. Funding costs started to rise later in 2022 and continued in 2023, and contributed to the contraction of NIM at some banks.

Chart 5

Net Interest Margins Rebounded in 2022 After Reaching a Record Low

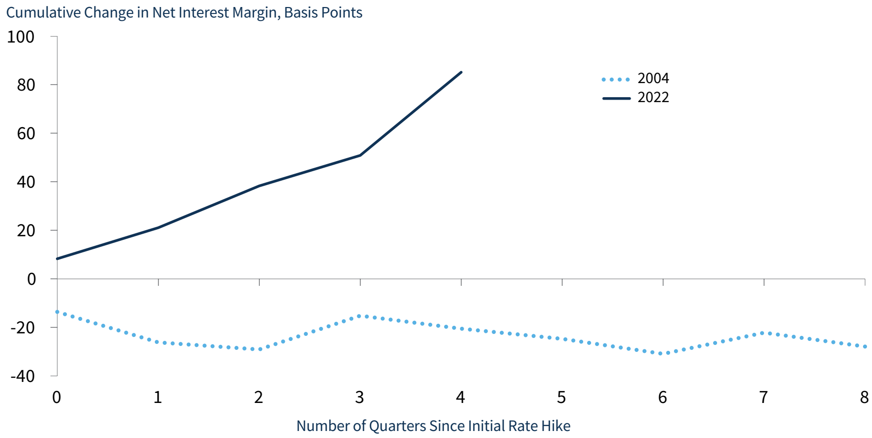


Sources: FDIC and Federal Reserve Board (Haver Analytics).
Note: Data as of first quarter 2023. For 2002 to 2022, NIM is calculated as the full-year net interest income divided by the five-quarter average earning assets. For 2023, NIM is calculated as the quarterly annualized net interest income divided by the two-quarter average earning assets. Effective federal funds rate data represent end-of-period values (annual through 2022 and quarterly for 2023)

[21] Data collection began in 1984.

Chart 6

The Cumulative Change in Net Interest Margin for the Industry Was Significantly Greater in 2022 Than in 2004 to 2006



Source: FDIC.
Note: Data as of first quarter 2023. The two years (2004 and 2022) depict the beginning of interest rate hike cycles. The cumulative change in NIM is the difference between the NIM at a given quarter compared to the quarter before the rate hike. NIM is annualized and reflective of the aggregate NIM for all banks.

Median NIM followed a similar pattern as aggregate NIM with a slightly larger increase in 2022 than in the 2004 cycle.[22] In 2022, the majority of bank asset size groups reported growth in NIM relative to their 2021 ratios, with the increase being more pronounced for larger banks (Table 4). NIM at more than 65 percent of banks increased in 2022 in varying amounts (Chart 7). The median NIM continued to trend upward in first quarter 2023 to 3.51 percent as the rise in median yield on earning assets was larger than the rise in the median cost of funding earning assets.

By comparison, in the 2004 cycle, both the median yield on earning assets and the median cost of funds rose more than in 2022, in part reflecting differences in the maturities of assets versus liabilities.[23] Banks held more shorter-term assets during the 2004 cycle. When interest rates started to rise, the loans that were made at higher interest rates represented a larger share of portfolios, which contributed to the notable rise in asset yields. Banks also paid more for deposits, which moderated the median increase in NIM.

[22] The difference between the median yield on earning assets and the median cost of funding earning assets will not tie to the median NIM or change in NIM as the median figures may represent different banks.
[23] Huberto M. Ennis, Helen Fessenden, and John R. Walter, "Do Net Interest Margins and Interest Rates Move Together?" Federal Reserve Bank of Richmond Economic Brief, May 2016, https://www.richmondfed.org/publications/research/economic_brief/2016/eb_16-05.

Table 4

Net Interest Margins for Larger Banks Rose Sharply in 2022 and Declined in 2004 to 2006

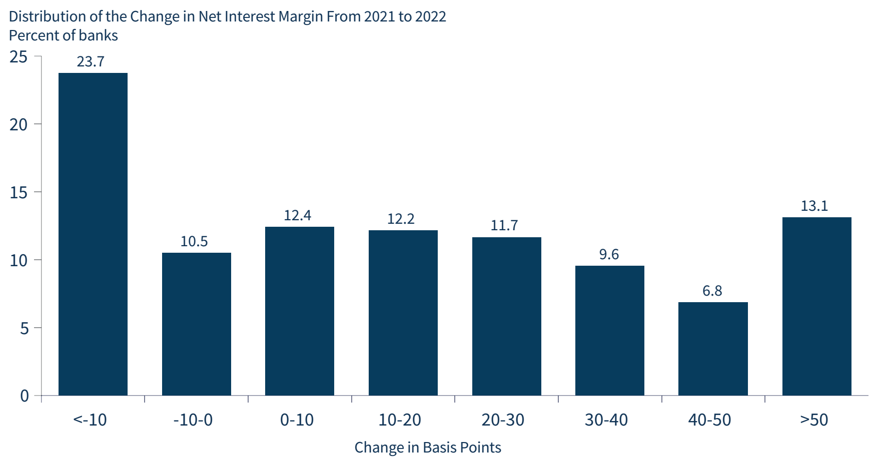
Median Annual Net Interest Margin (Percent)

	2003	2004 to 2006	2012 to 2021	2021	2022
Industry	4.00	4.05	3.62	3.27	3.38
Asset Size Groups					
Greater Than $250 Billion	3.71	3.20	2.97	1.99	2.43
$10 Billion to $250 Billion	3.66	3.40	3.28	2.91	3.29
$1 Billion to $10 Billion	3.76	3.78	3.52	3.24	3.42
$100 Million to $1 Billion	3.98	4.03	3.66	3.32	3.41
Less Than $100 Million	4.05	4.12	3.60	3.18	3.20

Source: FDIC.
Note: NIM is calculated as the full-year net interest income divided by the five-quarter average earning assets. Simple average is calculated for multiple years.

Chart 7

Net Interest Margin Increased From 2021 to 2022 for Most Banks



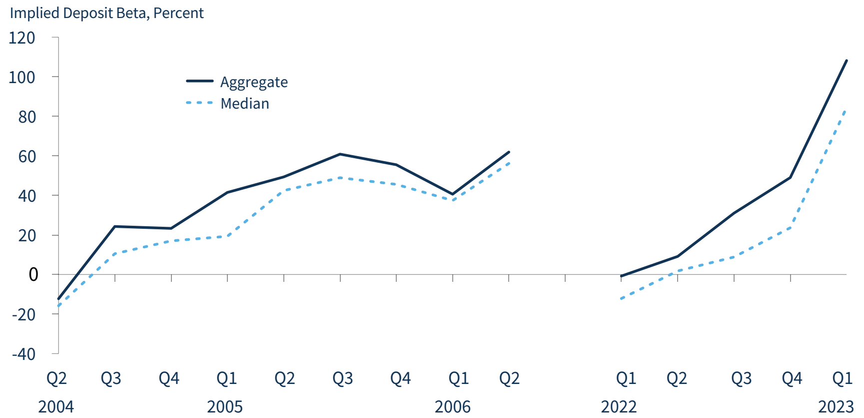
Source: FDIC.
Note: Data as of fourth quarter 2022. Change in NIM is calculated as the difference between the full-year NIM in 2021 and 2022. The population includes only banks that existed in both 2021 and 2022.

DEPOSITS AND FUNDING COSTS

Bank deposit rates tend to increase more gradually than do market interest rates. Bank deposit rates in 2022 did not begin to rise appreciably with market rates at first, as deposits were generally at high levels, reducing the need to raise deposit rates quickly.[24] Later in 2022 and into 2023, however, deposit interest rates began to be more responsive to changes in market rates. Implied deposit betas, which measure sensitivity to market rates, started to increase (Chart 8).[25]

Chart 8

The Increase in the Implied Deposit Beta Was Larger and Faster in 2022 Than in 2004 to 2006



Source: FDIC.
Note: Data as of first quarter 2023. Implied deposit beta represents the change in the estimated quarterly average deposit rate divided by the change in the federal funds target rate. Average deposit rates represent quarterly average interest expense divided by average interest-bearing deposit levels, which are an average between current and prior quarter-end balances.

The increase in deposit betas was more pronounced later in 2022 than earlier in the year. While the federal funds target rate increased by the same degree in both second and fourth quarter 2022 (125 basis points), the aggregate implied deposit beta for the banking industry increased from 9 percent in second quarter 2022 to 49 percent in fourth quarter 2022. The increase reflects higher quarterly cost of interest-bearing deposits, which rose 11 basis points in second quarter 2022 and 61 basis points in fourth quarter 2022. Banks tend to delay passing on rate

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[24] Bank deposits rose to unusually high levels in 2020 and 2021 reflecting changes in consumer savings during onset of the COVID-19 pandemic in 2020 and expanded government support programs. For a discussion on the expansion of the deposit base and the implications for banks, see Caitlyn R. Kasper and Benjamin Tikvina, "Implications of Record Deposit Inflows for Banks During the Pandemic," *FDIC Quarterly* 15 no. 4 (2021): 45–54, https://www.fdic.gov/analysis/quarterly-banking-profile/fdic-quarterly/2021-vol15-4/article2.pdf.

[25] Implied deposit beta represents the change in the estimated quarterly average deposit rate divided by the change in the quarterly federal funds target rate. For example, if the federal funds target rate increases by 50 basis points and the average cost of interest-bearing deposits increases by 25 basis points, then the implied deposit beta is 50 percent.

hike increases to depositors in order to maximize NIM, as reflected initially in low deposit betas. However, as depositors reach for greater yields, deposit competition later in the cycle increases the pressure for banks to increase deposit rates to retain depositors, and deposit betas increase.[26]

As bank deposit rates remained below market rates, deposit growth weakened during both the 2004 and the 2022 rate hike cycles. In particular, banking industry aggregate deposit growth slowed during both cycles and turned negative in 2022 (Chart 9). The decline in total deposits for the banking industry in 2022 followed a period of high deposit growth. The decline may reflect a normalization after reaching high levels during the pandemic. Bank deposit rates remaining below market rates also may have contributed to declines in deposits at some banks as depositors shifted to higher-yielding investments.[27] The decline in total deposits was led by large declines in uninsured deposits, as these may reflect larger deposits that may be more sensitive to higher interest rates. Although insured deposits increased, the decline in uninsured deposits led to the largest quarterly decline in total deposits in first quarter 2023 since data collection began in 1984.

The median deposit growth rates in Table 5 reflect the experience of typical small banks. Similar to the aggregate deposit growth in Chart 9, effects on median deposit growth in the 2004 cycle were more muted than in the 2022 cycle. Median deposit growth remained steady (compared to the year-earlier level) at 5.2 percent during the 2004 cycle. In contrast, median deposit growth in 2022 of 2.6 percent was low relative to the ten-year average and much lower than in 2021. The relatively slow median deposit growth in 2022 reflects a normalization from strong growth in 2021. The slowdown in deposit growth continued, as median deposit growth was flat in first quarter of 2023.[28]

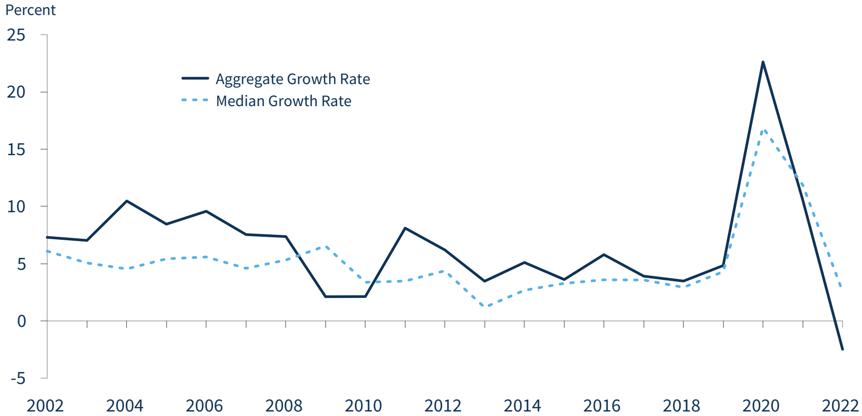
[26] Alena Kang-Landsberg, Stephan Luck, and Matthew Plosser, "Deposit Betas: Up, Up, and Away?" Federal Reserve Bank of New York Liberty Street Economics, April 11, 2023, https://libertystreeteconomics.newyorkfed.org/2023/04/deposit-betas-up-up-and-away/.

[27] Gara Afonso, Marco Cipriani, Catherine Huang, Abduelwahab Hussein, and Gabriele La Spada, "Monetary Policy Transmission and the Size of the Money Market Fund Industry: An Update," Federal Reserve Bank of New York Liberty Street Economics, April 3, 2023, https://libertystreeteconomics.newyorkfed.org/2023/04/monetary-policy-transmission-and-the-size-of-the-money-market-fund-industry-an-update/.

[28] The banking stress in early March 2023 also contributed to deposit outflows at many banks. On March 8, 2023, Silvergate Bank announced its intent to self-liquidate. On March 10, 2023, the California Department of Financial Protection and Innovation (CADFPI) closed Silicon Valley Bank (SVB). Contagion effects from SVB's failure began to spread through traditional media, social media, and short sellers to other banks with perceived similar risk characteristics, notably, those with high levels of uninsured deposits, concentrations of customers in the venture capital and tech industries, and high levels of unrealized losses on securities. Contagion effects initially manifested in large declines in stock prices and then in deposit outflows at certain other banks. For two of these banks—Signature Bank and First Republic Bank—deposit outflows became deposit runs and exposed other weaknesses that could not be overcome, leading to their failures. On March 12, 2023, the New York State Department of Financial Services closed Signature Bank of New York. On May 1, 2023, CADFPI closed First Republic Bank.

Chart 9

Total Deposits Began to Decline in 2022, in Part Reflecting Normalization From Unusually High Levels in 2020 and 2021



Source: FDIC.
Note: Data as of fourth quarter 2022. Growth rate is calculated as the annual change in balance as of December 31 of each year. Median growth is adjusted for mergers.

Deposit trends varied across banks in 2022, with more than half of banks reporting deposit growth. The largest banks had the greatest median deposit outflow in 2022, despite increasing deposit interest rates at a faster rate.[29] Smaller banks had positive median growth in deposits (Table 5). During the 2004 cycle, larger banks reported faster deposit growth than small banks.

Table 5

Deposit Growth Moderated in 2022 After Strong Gains in 2021, While Deposit Growth Was More Stable in 2004 to 2006

Median Annual Growth in Total Deposits (Percent)

	2003	2004 to 2006	2012 to 2021	2021	2022
Industry	5.1	5.2	5.5	11.9	2.6
Asset Size Groups					
Greater Than $250 Billion	11.5	12.8	7.5	5.5	–4.8
$10 Billion to $250 Billion	5.4	8.7	8.7	11.4	–0.6
$1 Billion to $10 Billion	6.6	8.8	8.3	13.9	2.6
$100 Million to $1 Billion	6.1	6.7	5.7	12.3	3.0
Less Than $100 Million	3.8	2.9	3.1	8.3	1.3

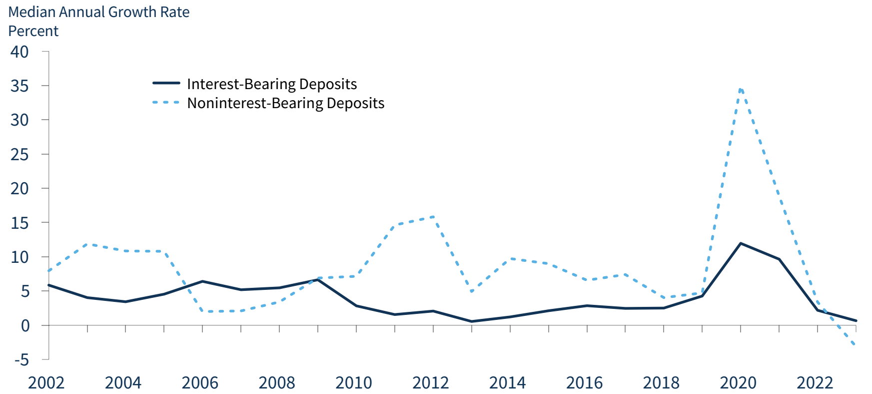
Source: FDIC.
Note: Growth rate is calculated as the annual change in balance as of December 31 of each year, adjusted for mergers. Simple average is calculated for multiple years.

[29] Banks in the largest asset size group had the highest median increase in the cost of interest-bearing deposits—up 50 basis points in 2022 and 130 basis points between fourth quarter 2022 and first quarter 2023. This is significantly higher than the median increase for all banks—up 8 basis points in 2022 and 70 basis points between fourth quarter 2022 and first quarter 2023.

Deposit costs rose in 2022 as depositors shifted funds to interest-bearing accounts. The median cost of interest-bearing deposits rose 8 basis points in 2022 to 0.48 percent, with more than 60 percent of banks reporting an increase, albeit mostly small. Banks in the largest asset size group reported the highest median cost of interest-bearing deposits (0.54 percent) while banks in the smallest asset size group reported the lowest median cost of interest-bearing deposits (0.42 percent). Banks for which NIM decreased in 2022 tended to pay higher interest on deposits compared to banks for which NIM increased.[30] The median annualized cost of interest-bearing deposits rose 70 basis points in first quarter 2023 to 1.18 percent as banks continued to compete for business and depositors shifted funds from noninterest-bearing to interest-bearing products (Chart 10).[31] These values reflect each bank's average funding costs for the quarter and therefore understate the increase in funding costs for marginal deposits, as deposit rates for new deposits would be higher.

Chart 10

Deposit Composition Shifted More Toward Interest-Bearing Deposits in 2022



Source: FDIC.
Note: Data as of first quarter 2023. For 2002 to 2022, growth rate is calculated as the annual change in balance as of December 31 of each year. For 2023, growth rate is calculated as the annual change in balance as of March 31. Median growth is adjusted for mergers.

[30] At banks for which NIM decreased, the median increase in cost of interest-bearing deposits was 6 basis points compared to 2 basis points at banks for which NIM increased. The median increase was 3 basis points for the 4,691 banks that filed Call Reports in both 2021 and 2022. Note that this calculation reflects the median change in cost of interest-bearing deposits by calculating the median value of the difference in the cost of interest-bearing deposits in 2021 and 2022 for each bank. This is different from the 8 basis points change in median cost of interest-bearing deposits, which calculates the median cost of interest-bearing deposits in 2021 and 2022 and takes the difference between the two median values (the median values in 2021 and 2022 may reflect values for different banks).

[31] In first quarter 2023, some deposits within banks shifted from noninterest-bearing deposits, which declined at a median rate of 3.1 percent, to interest-bearing deposits, which increased at a median rate of 0.7 percent. Banks that had the largest annual growth (top 25th percentile) in interest-bearing deposits in first quarter 2023 reported a median annual increase in cost of interest-bearing deposits of 26 basis points, compared to 15 basis points at banks in the bottom 75th percentile.

Banks facing deposit outflows in 2022 turned to other borrowings for liquidity and funding sources to finance loan growth during the year. The median wholesale-funds-to-assets ratio increased from 12.3 percent in 2021 to 14.7 percent in 2022 and to 15.6 percent in first quarter 2023.[32] The largest banks reported the largest increase in their median wholesale-funds-to-assets ratio, from 10.4 percent in 2021 to 17.4 percent in 2022. The increase was broad based, as 68.1 percent of banks reported an increase in their wholesale-funds-to-assets ratio. This trend is similar to the 2004 to 2006 cycle when the median wholesale-funds-to-assets ratio increased from 11.8 percent in 2003 to 13.2 percent in 2006.

UNREALIZED LOSSES ON SECURITIES

Rising interest rates reduce the value of securities that yield a fixed interest rate. These valuation declines would result in unrealized losses on securities but do not necessarily result in losses for banks as long as they hold these securities.[33] Bank investment securities for which management has the positive intent and ability to hold to maturity are classified as held-to-maturity, while securities that may be sold before maturity are classified as available-for-sale. Available-for-sale securities are reported at fair (market) value, with unrealized gains or losses (i.e., changes in market values) reflected in equity (and regulatory capital for some banks).[34] In contrast, held-to-maturity securities are reported at amortized cost and unrealized losses are not generally reflected in equity or regulatory capital.[35]

Unrealized losses may reduce liquidity, reduce the level of tangible equity, and weigh on future earnings.[36] Investment securities often represent a large proportion of an institution's on-balance sheet liquidity because they can be sold for cash or pledged to obtain additional funding. Securities with lower values would be a less-favorable source of liquidity since losses would have to be realized in the event of their sale, and banks' ability to pledge collateral or meet margin requirements when seeking access to wholesale or other sources of alternative funding may be reduced. Since depreciated securities earn below-market interest rates, holding large amounts of them also tends to depress earnings.

[32] Wholesale funding includes federal funds purchased and securities sold under agreement to repurchase; Federal Home Loan Bank borrowings; brokered deposits (net of reciprocal deposits), municipal, state, and foreign deposits (foreign deposits are not FDIC-insured); other borrowings; and listing services.

[33] Unrealized gains (losses) on securities solely reflect the difference between the market value as of quarter end and the book value of non-equity securities.

[34] Unrealized gains (losses) on available-for-sale securities are reported in equity as part of accumulated other comprehensive income (AOCI) and may affect capital (advanced approaches banks and those that opt-in to the AOCI-related adjustments must report AOCI as part of regulatory capital). On July 27, 2023, the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, and the FDIC issued a notice of proposed rulemaking that, among other proposed changes, would require banks with total assets of $100 billion or more to include unrealized gains and losses on available-for-sale debt securities in their capital ratios, resulting in a measure that better reflects institutions' actual loss absorption capacity at a specific point in time and in a consistent set of capital requirements across large banks. See FDIC, "Agencies Request Comment on Proposed Rules to Strengthen Capital Requirements for Large Banks," news release no. PR-55-2023, July 27, 2023, https://www.fdic.gov/news/press-releases/2023/pr23055.html.

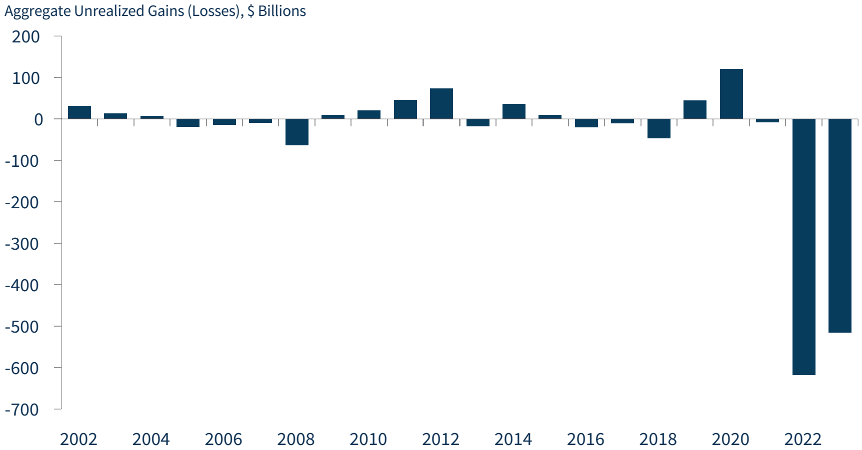
[35] Exceptions can exist if a bank reclassifies a security from available-for-sale to held-to-maturity.

[36] W. Blake Marsh and Brendan Laliberte, "The Implications of Unrealized Losses for Banks," Federal Reserve Bank of Kansas City Economic Review, Second Quarter 2023, https://www.kansascityfed.org/Economic%20Review/documents/9473/EconomicReviewV108N2MarshLaliberte.pdf.

Higher rates significantly increased unrealized losses on available-for-sale and held-to-maturity securities in 2022, and unrealized losses remained elevated in 2023 (Chart 11). Continued depreciation of bank investment portfolios could increase liquidity risk, particularly for banks with higher shares of longer-dated securities, should banks have to sell investments and realize losses to meet their liquidity needs (box on page 64).[37] This vulnerability was highlighted in early 2023, when deposit outflows at banks with high levels of uninsured deposits became deposit runs and exposed other weaknesses that could not be overcome, leading to the failures of three banks.[38]

Chart 11

Unrealized Losses Remained Elevated Through First Quarter 2023



Source: FDIC.
Note: Data as of first quarter 2023. Data for 2002 to 2022 are as of December 31. Data for 2023 are as of March 31. Unrealized gains (losses) on securities solely reflect the difference between the market value as of quarter end and the book value of non-equity securities.

The unrealized losses in 2022 were significantly higher than during the previous two decades, including during the 2004 cycle, in part due to larger securities holdings. Banks responded to the surge in liquidity from higher deposits in 2020 and 2021 primarily by increasing their investment in longer-term securities rather than loans. Loan growth was tepid in 2020, and interest rates were low through 2021.[39] The share of securities with maturities greater than three years was much higher in 2022 than in 2004 (Chart 12). When interest rates rose sharply in 2022, the market value of securities holdings depreciated significantly. The median unrealized losses as a percent of total assets grew to

[37] A bank's risk profile varies depending on the duration, maturity, differential, and composition of assets (loans and investments) and liabilities (deposits and other borrowings). Carl White, "Rising Interest Rates Complicate Banks' Investment Portfolios," On the Economy Blog, Federal Reserve Bank of St. Louis, February 9, 2023, https://www.stlouisfed.org/on-the-economy/2023/feb/rising-rates-complicate-banks-investment-portfolios#:~:text=While%20rising%20interest%20rates%20give,investment%20securities%20held%20as%20assets.

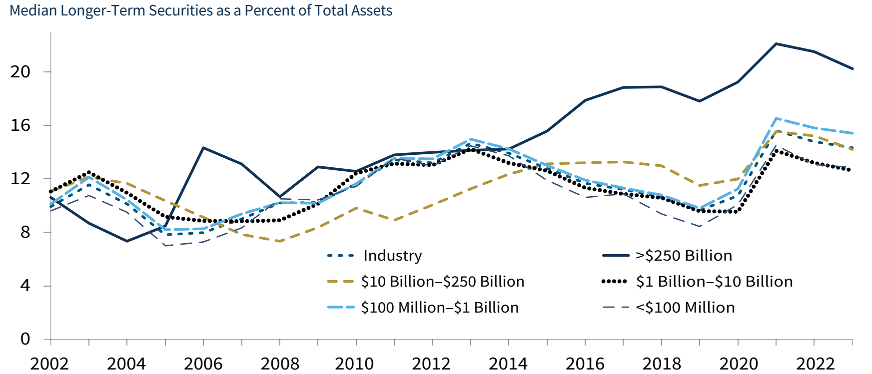
[38] For more information, see "Remarks by Chairman Martin J. Gruenberg on Oversight of Financial Regulators: Financial Stability, Supervision, and Consumer Protection in the Wake of Recent Bank Failures Before the Committee on Banking, Housing, and Urban Affairs, United States Senate," May 2023, https://www.fdic.gov/news/speeches/2023/spmay1723.html.

[39] The median loan growth rate was 1.4 percent in 2020. The median deposit growth was 16.9 percent in 2020 and 11.9 percent in 2021. The median securities growth was 15.3 percent in 2020 and 31.4 percent in 2021.

–2.2 percent in 2022 and slightly shrank to –1.9 percent in first quarter 2023 (Chart 13). Banks that held a higher share of longer-term loans and securities at the beginning of 2022 fared worse than banks that held a lower share. The largest asset size group reported the largest median unrealized losses to total assets ratio, likely because those banks had the highest median ratio of longer-term securities to assets in 2021 before the interest rate increase cycle in 2022 (Chart 12).[40] Conversely, the largest asset size group had the lowest exposure to unrealized losses on securities in 2004 to 2006, likely because they had the lowest median ratio of longer-term securities to assets in 2003.

Chart 12

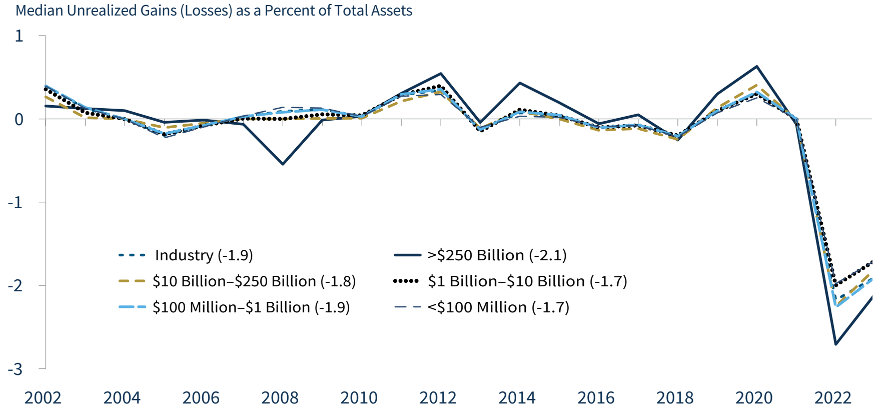
Banks Held a Greater Share of Longer-Term Securities in 2022 Than in 2004



Source: FDIC.
Note: Data as of first quarter 2023. Data for 2002 to 2022 are as of December 31. Data for 2023 are as of March 31. Longer-term securities have maturities greater than three years.

Chart 13

Unrealized Losses Were the Largest for Banks With Assets Greater Than $250 Billion



Source: FDIC.
Note: Data as of first quarter 2023. Data for 2002 to 2022 are as of December 31. Data for 2023 are as of March 31. Unrealized gains (losses) on securities solely reflect the difference between the market value as of quarter end and the book value of non-equity securities.

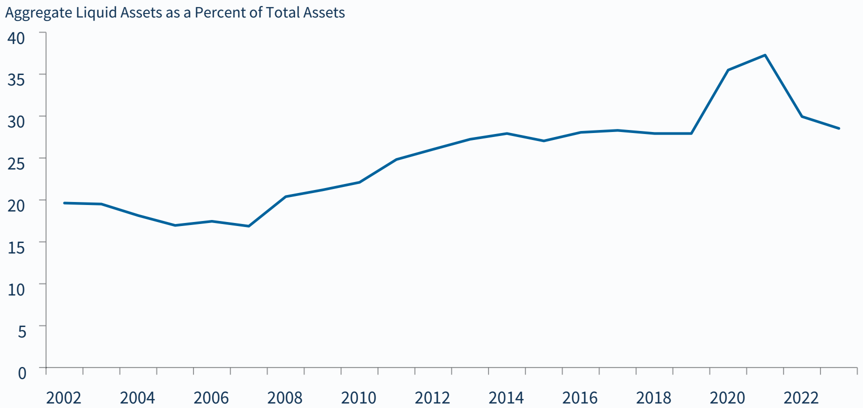
[40] Longer-term securities have maturities greater than three years. Banks in the largest asset size group had the highest median longer-term-securities-to-assets ratio of 22.1 percent in 2021, significantly higher than the median ratio of 15.6 percent for all banks. Conversely, banks in the largest asset size group had the lowest median-longer-term-securities-to-assets ratio of 8.7 percent in 2003, lower than the median ratio of 11.6 percent for all banks.

LIQUIDITY DECLINED DURING THE TWO INTEREST RATE CYCLES

Deposit outflows, rapid loan growth, unrealized losses on securities, and growth of secured wholesale funding all contributed to the decline in the liquid assets to total assets ratio in 2022.[41] For the industry as a whole, bank liquidity, as measured by the ratio of liquid assets to total assets, declined but remained above pre-pandemic levels (Chart 14). The ratio of liquid assets to total deposits, a measure of a bank's ability to meet an outflow of deposits, also declined as lower deposits and higher cash and balances due from depository institutions were offset by declines in securities. Liquidity also declined for the banking industry during the 2004 cycle but to a smaller degree.

Chart 14

Bank Liquidity Began to Decline in 2022 but Normalized Above Its 2019 Level



Source: FDIC.
Note: Data as of first quarter 2023. Data for 2002 to 2022 are as of December 31. Data for 2023 are as of March 31. Liquid assets are defined as cash, federal funds sold, securities purchased under agreements to resell, and securities (including unrealized gains/losses on securities) less pledged securities.

Liquid assets for the median bank also declined. The median liquid assets to total assets ratio fell from 30.3 percent in 2021 to 22.2 percent in 2022 and to 21.4 percent in first quarter 2023. The largest banks reported the largest decline in their median liquid assets to total assets ratio, from 45.3 percent in 2021 to 36.2 percent in 2022. The decrease was broad based, as 86.4 percent of banks reported a decrease in their liquid assets to total assets ratio. This trend is similar to the 2004 cycle, when the median liquid assets to total assets ratio decreased from 22.5 percent in 2003 to 17.3 percent in 2006.

[41] Liquid assets are defined as cash, federal funds sold, securities purchased under agreements to resell, and securities (including unrealized gains/losses on securities) less pledged securities.

CONCLUSION

The sharp increase in interest rates in 2022 resulted in shifting conditions for the banking industry. This rate hike came after an earlier pandemic-related surge in deposits—with proceeds often invested in longer-term securities—and amid rapid loan growth and general price inflation in 2022. With loans growing rapidly, higher interest rates initially supported growth in net interest income and NIM. More recently, higher market interest rates have resulted in deposit outflows and higher funding costs, along with high levels of unrealized losses on securities. Challenges relative to decelerating loan growth, increased funding costs, and decreased liquidity became more evident by first quarter 2023. Some of these trends were apparent in the 2004 cycle. Banks benefited from higher rates at the beginning of the 2004 cycle, but to a more limited extent. Banks were also challenged in the 2004 cycle by decelerating growth of loans and deposits and decreased fair value of assets and liquidity. While the effects of higher interest rates on banking outcomes generally followed a similar pattern between the two cycles, many factors were at play, including economic and financial market conditions, asset and liability composition, and asset maturity structures.

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