FEDERAL RESERVE BANK OF KANSAS CITY | 4Q 2023

Bank Capital ANALYSIS

A horizontal comparison of capital adequacy

Bank Capital Analysis Semiannual Update

By Sabrina Pellerin

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The Bank Capital Analysis provides a horizontal comparison of capital adequacy among banking organizations of varying size and complexity.

Chart 1 shows leverage capital trends over time for U.S. banking organizations. Banks of all size groups entered the pandemic with stronger capital ratios than prior to the 2007-2008 financial crisis, though the trend in leverage ratios at the largest banks had started flattening and even declining prior to the pandemic. Balance sheet growth stemming from pandemic policy responses put immediate downward pressure on the weighted average tier 1 leverage ratio for all U.S. banking groups, but the trend has reversed with banks across all portfolio groups approaching, but still below, pre-pandemic levels.

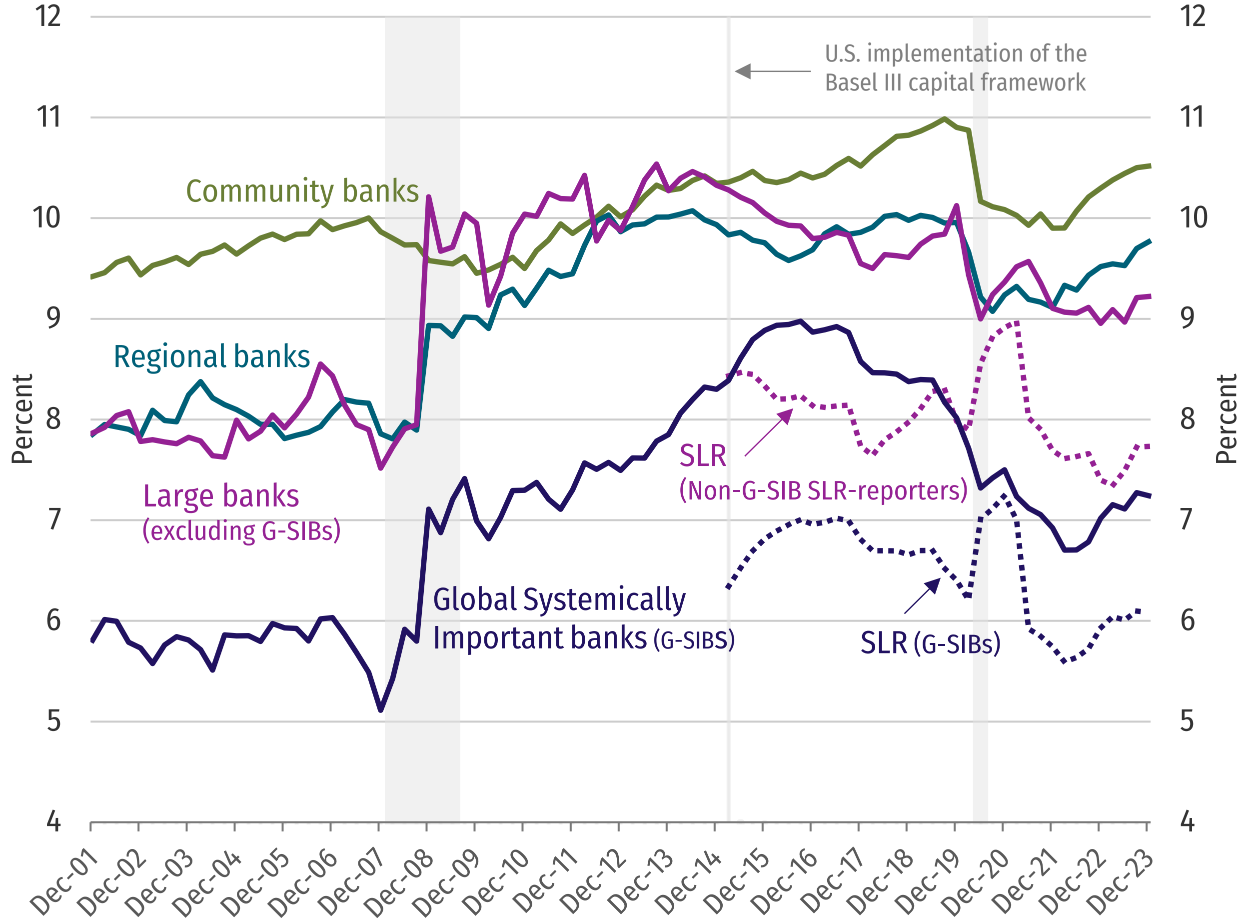
U.S. Global Systemically Important Banks' (G-SIBs) weighted average tier 1 leverage ratio increased 22 basis points (bps) year-over-year (YoY), to 7.24 percent as of year-end 2023, but remains below leverage capital ratios for large (9.22 percent), regional (9.76 percent) and community (10.52 percent) banking organizations, as shown in Table 1. As of December 31, 2023, the weighted average supplementary leverage ratio (SLR), also known as the Basel III leverage ratio, for U.S. G-SIBs increased 15 bps YoY to 6.08 percent (Table 1).[1] The trend has been increasing since reaching a low of 5.59 percent in the first half of 2022 (Chart 1). The weighted average Basel III leverage ratio across foreign G-SIBs declined over this period and remains lower than that of U.S. G-SIBs, with the exception of Asian G-SIBs.

For additional analysis on factors driving changes in capital ratios, see the Supplement to this document.

Sabrina Pellerin is an advanced risk specialist in the Division of Supervision and Risk Management at the Federal Reserve Bank of Kansas City.

[1] Total leverage exposure, the denominator of the SLR, includes certain off-balance sheet exposures in addition to on-balance sheet assets. The tier 1 leverage ratio does not include off-balance sheet items, which are relatively negligible for all but the largest banking organizations. As such, the SLR can also be compared to the tier 1 leverage ratio for smaller banking organizations. For more information on the Bank Capital Analysis, see: Understanding the Bank Capital Analysis - Federal Reserve Bank of Kansas City (kansascityfed.org).

Chart 1
SLR and Tier 1 Leverage Ratio
U.S. banking organizations by supervisory portfolio group (% weighted average)



Notes: Tier 1 capital as a percent of total leverage exposure (for SLR) and as a percent of average total assets (for Tier 1 Leverage ratio). SLR reported only by banking organizations that generally have assets greater than $250 billion or on-balance sheet foreign exposures above $10 billion. Portfolio groups are established by the federal banking agencies and reflect the group banking organizations were in as of February 22, 2024. Gray shaded bars denote recessions.
Sources: Federal Reserve Y-9C Reports, FFIEC Call Reports, and S&P Global Market Intelligence LLC.

Table 1
Capitalization Ratios
U.S. Global Systemically Important Banks (G-SIBs) and Large, Regional, and Community Banking Organizations[i]

	Tier 1 Capital[ii] ($Billions)	Total Assets[iii] ($Billions)	Risk-Weighted Assets[iv] ($Billions)	Leverage Exposure[v] ($Billions)	Tier 1 Risk-Based Capital Ratio[vi] (Percent)	Tier 1 Leverage Ratio[v] (Percent)	SLR[v] (Percent)	Goodwill and Other Intangibles[vii] ($Billions)	Deferred Tax Assets[viii] ($Billions)	Price-to-Book Ratio[ix]	Price-to-Adjusted Tangible Book Ratio[ix]
U.S. G-SIBs											
Bank of America Corporation	223	3,180	1,651	3,676	13.52	7.12	6.07	71	15	1.01	1.50
Bank of New York Mellon Corporation	23	410	156	314	14.76	6.01	7.35	19	0	1.09	2.31
Citigroup Inc.	173	2,412	1,149	2,965	15.02	7.20	5.82	24	31	0.52	0.74
Goldman Sachs Group, Inc.	110	1,642	693	1,996	15.92	7.02	5.53	7	7	1.18	1.37
JPMorgan Chase & Co.	277	3,875	1,672	4,540	16.59	7.24	6.11	56	10	1.63	2.09
Morgan Stanley	78	1,194	456	1,430	17.14	6.74	5.47	24	3	1.68	2.38
State Street Corporation	15	297	112	240	13.38	5.54	6.24	9	1	1.07	1.97
Wells Fargo & Company	160	1,932	1,232	2,254	12.98	8.50	7.09	26	0	1.07	1.27
U.S. G-SIBs ($ Total, % Weighted Average)	**1,059**	**14,942**	**7,120**	**17,414**	**14.88**	**7.24**	**6.08**	**236**	**67**	**1.08**	**1.74**
European and Canadian G-SIBs											
Banco Santander (Spain)	95	1,986	689	2,019	13.75		4.68	22	35	0.64	1.39
Barclays (UK)	77	1,882	437	1,488	17.66		5.20	10	8	0.40	0.53
BNP Paribas (France)	119	2,864	778	2,594	15.28		4.58	11	7	0.65	0.76
Crédit Agricole Group (France)	124	2,727	674	2,278	18.46		5.50	22	10	NA	NA
Deutsche Bank (Germany)	62	1,451	387	1,371	16.12		4.50	8	10	0.38	0.51
Group BPCE (France)	79	1,707	506	1,562	15.57		5.04	6	6	NA	NA
HSBC (UK)	144	3,039	854	2,575	16.88		5.59	12	9	0.93	1.07
ING Bank (Netherlands)	60	1,078	353	1,190	16.89		5.01	1	2	0.88	0.93
Royal Bank of Canada (Canada)	72	1,445	441	1,625	16.29		4.40	14	6	1.71	2.05
Société Générale (France)	67	1,718	430	1,572	15.56		4.25	9	5	0.33	0.43
Standard Chartered (UK)	40	823	244	847	16.30		4.70	6	1	0.52	0.63
Toronto Dominion (Canada)	68	1,408	433	1,553	15.73		4.40	16	5	1.42	1.97
UBS (Switzerland)	92	1,717	547	1,695	16.90		5.45	8	12	1.16	1.50
European and Canadian G-SIBs ($ Total, % Weighted Average)	**1,099**	**23,844**	**6,772**	**22,370**	**16.23**		**4.91**	**145**	**117**	**0.65**	**0.93**
Asian G-SIBs											
Agricultural Bank of China Limited (China)	405	5,623	3,150	5,911	12.87		6.86	4	7	0.40	0.41
Bank of China Limited (China)	362	4,574	2,622	4,906	13.83		7.39	4	11	0.36	0.37
Bank of Communications Co., Ltd.	153	1,983	1,248	2,171	12.22		7.03	1	6	0.36	0.38
China Construction Bank (China)	443	5,405	3,158	5,660	14.04		7.83	3	17	0.36	0.38
Industrial and Commercial Bank of China (China)	527	6,303	3,475	6,625	15.17		7.95	5	15	0.36	0.38
Mitsubishi UFJ FG (Japan; JPY, Local GAAP)	124	2,817	959	2,333	12.88		5.29	11	2	0.76	0.84
Mizuho FG (Japan; JPY, Local GAAP)	75	1,924	539	1,673	13.94		4.49	5	1	0.62	0.68
Sumitomo Mitsui FG (Japan; JPY, Local GAAP)	89	2,027	579	1,761	15.35		5.04	7	1	0.66	0.71
Asian G-SIBs ($ Total, % Weighted Average)	**2,179**	**30,656**	**15,731**	**31,041**	**13.85**		**7.02**	**39**	**59**	**0.38**	**0.39**
U.S. banking organizations by size group ($ Total, % Weighted Average)											
G-SIBs	1,059	14,942	7,120	17,414	14.88	7.24	6.08	236	67	1.08	1.74
LBOs[x] (>$100B, excluding GSIBs)	408	4,504	3,416		11.94	9.22	7.73	112	35		
RBOs ($10B - $100B)	279	2,894	2,184		12.75	9.76		72	17		
CBOs (<$10B)	292	2,798	1,678		14.48	10.52		19	13		

Sources: Federal Reserve Y-9C Reports, FFIEC Call Reports, FFIEC 101 Reports, and S&P Global Market Intelligence LLC.

[i] G-SIBs: The Financial Stability Board (FSB) publishes the list of Global Systemically Important Banks (G-SIBs) each November. The December 31, 2023, Bank Capital Analysis uses the list of G-SIBs released on November 27, 2023. The list included eight U.S. banking organizations and 21 non-U.S. organizations, which reflects the addition of Bank of Communications (China) and the removal of Credit Suisse and UniCredit and is available on the FSB's website: www.fsb.org. Note that the other groups of U.S. banks reflect the supervisory portfolios of the federal banking agencies as of February 22, 2024. Data sources: FR Y-9C and S&P Global Market Intelligence LLC for U.S. G-SIBs and S&P Global Market Intelligence LLC for foreign G-SIBs. Large Banking Organizations (LBO): Banking organizations greater than $100 billion, excluding G-SIBs and subsidiaries of G-SIBs and non-U.S. banks. There are 16 bank holding companies included in the LBO group. Data source: FR Y-9C. Regional Banking Organizations (RBO): Generally, banking organizations between $10 and $100 billion, excluding subsidiaries of G-SIBs, non-U.S. banks and LBOs. There are 99 bank holding companies and four depository institutions with no holding company included in the RBO group. Data source: FR Y-9C (FFIEC Call Report for RBOs with no holding company). Community Banking Organizations (CBO): Banking organizations less than $10 billion, excluding subsidiaries of G-SIBs, non-U.S. banks, LBOs and RBOs. There are 3,799 depository institutions included in the CBO group. Data source: FFIEC Call Report, as banking organizations less than $3 billion in assets do not report the FR Y-9C.

[ii] Tier 1 capital is common equity capital less goodwill, certain other intangible assets, disallowed deferred tax assets (DTAs), plus additional qualifying tier 1 capital components. Advanced approaches (Category I and II) banking organizations, generally those above $700 billion in assets, must include most effects of accumulated other comprehensive income (AOCI), such as unrealized gains and losses on available-for-sale securities, in tier 1 capital, while non-advanced approaches organizations may neutralize the effects of most components of AOCI in tier 1 capital. Tier 1 capital is the numerator of the Tier 1 Risk-Based Capital Ratio, which uses risk-weighted assets (RWA) in the denominator, and of the Tier 1 Leverage and SLR. Note that regulatory capital measures are based on principles agreed to by the Basel Committee on Banking Supervision (BCBS) and implemented by regulators in member countries. In the U.S., capital requirements are established by the three Federal banking agencies. U.S. regulations include standardized approaches and advanced approaches. The requirements for Board-regulated institutions are in 12 CFR 217. The general phase-in period for the capital rules in the U.S. was 2014-2018. The phase-in period may differ for non-U.S. G-SIBs. The regulatory capital data for non-U.S. G-SIBs may be transitional or fully phased-in, depending upon data availability.

[iii] Total assets as reported in regulatory financial statements, which are subject to jurisdictional accounting standards.

[iv] In the U.S., advanced approaches banks calculate RWA and risk-based ratios using the standardized and advanced approaches and use the lower of the two ratios (the higher RWA amount).

[v] Leverage Ratios and Leverage Exposure: In the U.S., but not in other BCBS member countries, all banking organizations must report the Tier 1 Leverage Ratio (tier 1 capital/average assets for the leverage ratio). U.S. Category I, II and III banking organizations must also calculate the SLR, known outside the U.S. as the Basel III Leverage Ratio. The minimum required Basel III Leverage Ratio is 3 percent for G-SIBs and Category I-III organizations, and the BCBS leverage framework requires a buffer above the minimum Basel III Leverage Ratio for G-SIBs. In the U.S., the buffer, referred to as the enhanced SLR, is 2 percentage points for the holding company and 3 percentage points for the insured depository institution. The denominator of the SLR, called total leverage exposure, is a broader measure than the denominator for the Tier 1 Leverage Ratio. Total leverage exposure adjusts regulatory balance sheet assets for derivatives exposure, securities financing exposure and commitments. All G-SIBs report total leverage exposure using the same reporting form (Pillar 3 Report). U.S. G-SIBs report the SLR ratio in the FR Y-9C and the SLR details in the FFIEC 101 report. S&P Global Market Intelligence LLC reports the fully phased-in Basel III leverage ratio. In response to the COVID-19 pandemic, SLR-reporting U.S. banking organizations were temporarily permitted to exclude on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks from the calculation of leverage exposure, the denominator of the SLR, starting with June 30, 2020 financials through March 31, 2021 (see Board of Governors' April 14, 2020 Interim Final Rule available here). Jurisdictions in other countries also temporarily permitted the exclusion of central bank deposits from the Basel III leverage ratio, but the exclusion is not reported similarly across foreign G-SIBs and the effective dates differ. More detail is available here.

[vi] This ratio measures tier 1 capital to RWA.

[vii] Goodwill and other intangibles, such as deposit intangibles, purchased credit card relationships and nonmortgage servicing assets.

[viii] DTAs are the amounts by which taxes payable in future periods may be decreased due to temporary timing differences. DTAs may also include carryforwards of unused tax losses and carryforward of unused tax credits and are net of any valuation allowance.

[ix] Median price-to-book ratios and price-to-adjusted book ratios are used instead of averages for comparative groups. The price-to-book ratio is price as a percent of book value per share. Book value is calculated using financial period end common equity and common shares outstanding values. The price-to-adjusted tangible book ratio is calculated using financial period end tangible common equity (common equity is adjusted for goodwill, other intangibles and DTAs) and common shares outstanding values. Price-to-book ratios for the Chinese G-SIBs reflect H-shares. Data are not available for the Credit Agricole Group and Group BPCE.

[x] The SLR reported for the LBO group is the weighted average SLR for five of the 16 LBOs (U.S. Bancorp, The PNC Financial Services Group, Inc., Capital One Financial Corporation, Truist Financial Corporation, and Northern Trust Corporation) that are required to report the SLR.

Bank Capital Analysis: *Supplemental*

A horizontal comparison of capital adequacy

This supplement to the Bank Capital Analysis Report provides additional data and insights on factors influencing capital adequacy, such as changes to regulatory requirements and shareholder distributions.

- In the first half of 2020, as the impact of the COVID-19 pandemic drove unemployment rates to record highs and created widespread economic instability, the Federal Reserve and U.S. government took numerous emergency actions to support continued market functioning and provide relief to those affected by the pandemic. As a result of these policies and a flight to quality, deposits surged, and bank balance sheets grew rapidly—predominantly in liquid assets. This unprecedented asset growth drove leverage capital ratios down across all U.S. banking organizations. This trend reversed in 2022 as banks' tier 1 capital growth began outpacing asset growth, resulting in leverage ratios trending toward, but still below, pre-pandemic levels as of year-end 2023 (**Chart S.1**). While asset growth has slowed, bank balance sheets remain inflated—collectively having grown 33.6 percent since year-end 2019—but the composition has changed as conditions have evolved.
- Before loan demand picked up in the latter half of 2021 and into 2022, abundant liquidity and the prolonged low-rate environment led many banks to increase holdings of securities (primarily in longer-dated maturities), exposing them to heightened interest rate risk. While banks across all portfolio size groups collectively reduced securities balances by 6.5 percent YoY, they still hold 42.2 percent ($1.4 trillion) more securities as of December 31, 2023, than at year-end 2019.
- When interest rate policy shifted in March 2022 from near zero for an extended period of time to rapidly rising, unrealized losses mounted on banks' recently expanded available-for-sale (AFS) securities portfolios. As of December 31, 2023, aggregate unrealized losses on AFS securities across CBOs, RBOs and LBOs stood at $146.7 billion, representing 15.3 percent of tier 1 capital (**Chart S.3**).[2] While not reflected in regulatory capital ratios for these size groups, these unrealized losses are part of GAAP equity and have therefore weighed on banks' tangible common equity (TCE) ratios (**Chart S.4**). In contrast, G-SIBs must recognize unrealized gains and losses on AFS securities in regulatory capital (in accumulated other comprehensive income, or AOCI).[3] The change in AOCI over the rising-rate period from 2022 through year-end 2023 amounted to a combined decline in common equity across

[2] Calculated as fair value less amortized cost, which does not reflect tax effects.

[3] Applies only to Category I and II banks (eight G-SIBs and Northern Trust). All other banks can elect to exclude on an ongoing basis unrealized gains and losses in the calculation of regulatory capital ratios. Unrealized losses are estimated as fair value less amortized cost, which does not reflect tax effects. On July 27, 2023, the Board of Governors, jointly with the FDIC and OCC, released a proposal that would modify large bank capital requirements. The proposal imposes additional requirements on banks with assets over $100 billion, such as no longer permitting Category III and IV firms from opting out of reporting unrealized losses in regulatory capital and making Category IV firms subject to the SLR, among many other proposed changes.

the G-SIBs of approximately $47.0 billion (4.4 percent of tier 1 capital).[4] However, a reduction in capital distributions (predominantly share repurchases) and slower leverage exposure growth more than offset the adverse impact to regulatory capital from unrealized losses on AFS securities, resulting in the weighted-average SLR across the G-SIBs increasing in the second half of 2022 and through 2023 (**Chart S.2**).

- G-SIBs began shifting the composition of their securities portfolio away from AFS and towards held-to-maturity (HTM) securities prior to the rising rate cycle to mitigate potential adverse impacts of unrealized losses to regulatory capital.[5] As of December 31, 2023, G-SIBs collectively held 60.8 percent of their securities in HTM securities—up from 31.3 percent at year-end 2019—compared to 37.4 percent, 28.3 percent, and 16.3 percent for LBOs, RBOs, and CBOs, respectively (Chart S.5). Notably, LBOs, and to a lesser extent RBOs and CBOs, increased the percentage of securities held as HTM after the onset of the rising rate cycle given the adverse impact of unrealized losses on AFS securities to GAAP equity. While unrealized losses on HTM securities do not affect either GAAP equity or regulatory capital, they amounted to $200.2 billion (18.9 percent of tier 1 capital) across the G-SIBs and $56.2 billion (5.9 percent of tier 1 capital) for all other U.S. banking organizations, as of December 31, 2023 (**Chart S.3**).[6]
- After leverage and risk-based capital ratio trends diverged in the early part of the post-pandemic period due to the lower risk composition of balance sheets, they are now exhibiting similar trends. While the tier 1 risk-based capital (RBC) ratio for CBOs and RBOs has remained stable over the prior year, it has increased across the largest banks at a faster rate than the leverage ratio (**Chart S.6**). The relatively steeper increase in the tier 1 RBC ratio for the largest banks can be explained, in part, by banks' efforts in 2023 to manage risk-weighted assets in anticipation of higher risk-based capital requirements stemming from the federal banking agencies rulemaking efforts to implement the final phase of Basel III capital reforms.[7]

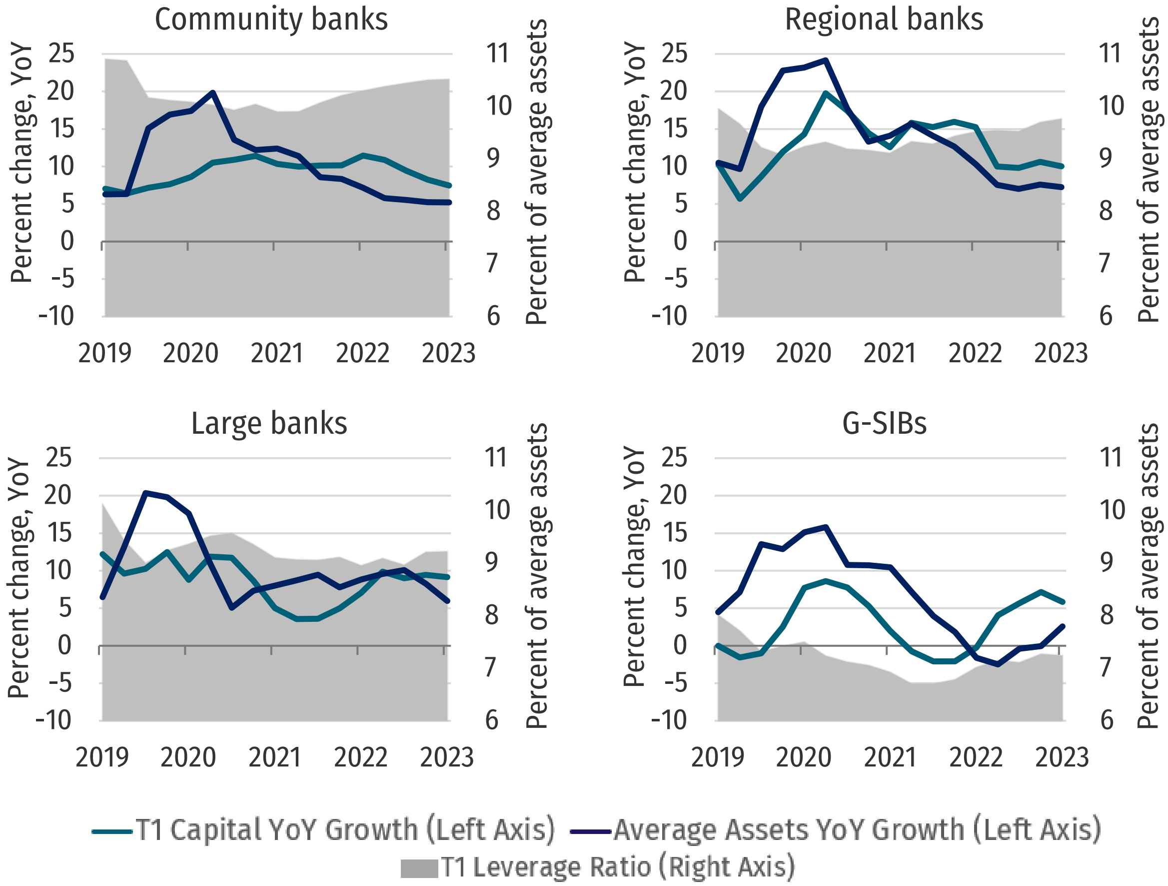
[4] Unrealized losses on AFS securities are not reported in bank regulatory reports as a separate line item in AOCI and are one among several components impacting G-SIB AOCI, but make up a considerable portion of the changes to AOCI in recent periods. The gross unrealized loss on AFS securities (i.e. the fair value less amortized cost) was $27.5 billion as of December 31, 2023 (does not reflect tax effects accounted for in AOCI).

[5] In 2019, as part of the Economic Growth, Regulatory Relief, and Consumer Protection Act tailoring rule changes, the threshold at which banking organizations could not opt-out of including AOCI in regulatory capital was increased from $250 billion or $10 billion in on-balance sheet foreign exposures (Advanced Approaches banks) to $700 billion or $75 billion of cross-jurisdictional activities (Category I and II banks).

[6] Calculated as fair value less amortized cost.

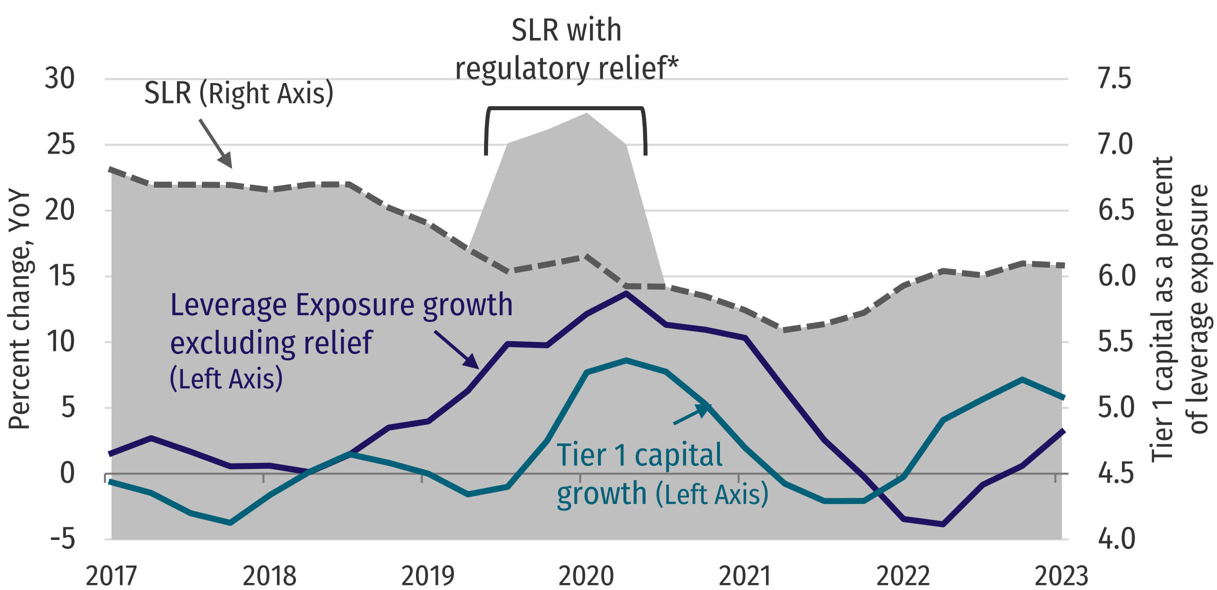
[7] On July 27, 2023, the federal banking agencies jointly released a notice of proposed rulemaking (NPR) to implement the final phase of Basel III capital reforms. The Federal Reserve Board also released on July 27, 2023, a separate NPR that would result in adjustments to the G-SIB surcharge calculation.

Chart S.1
Tier 1 (T1) Leverage Ratio Component YoY Growth by Bank Portfolio Group



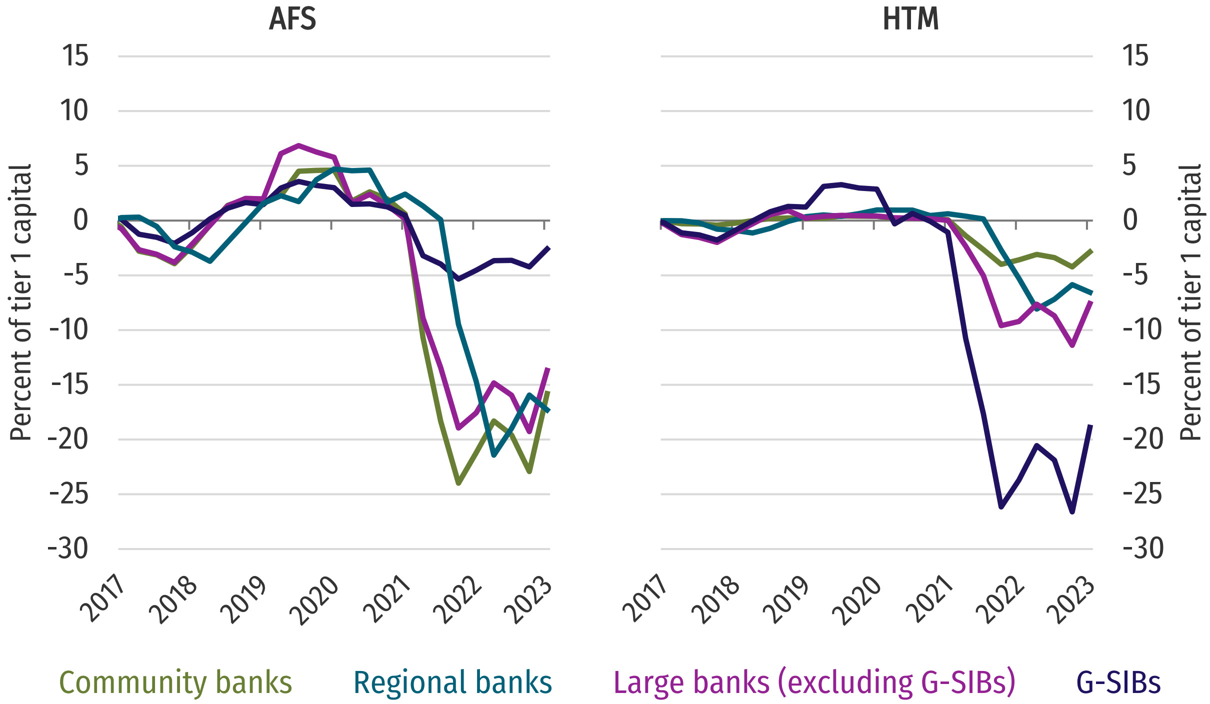
Sources: Federal Reserve Y-9C Reports and FFIEC Call Reports.

Chart S.2
SLR Component YoY Growth (U.S. G-SIBs)



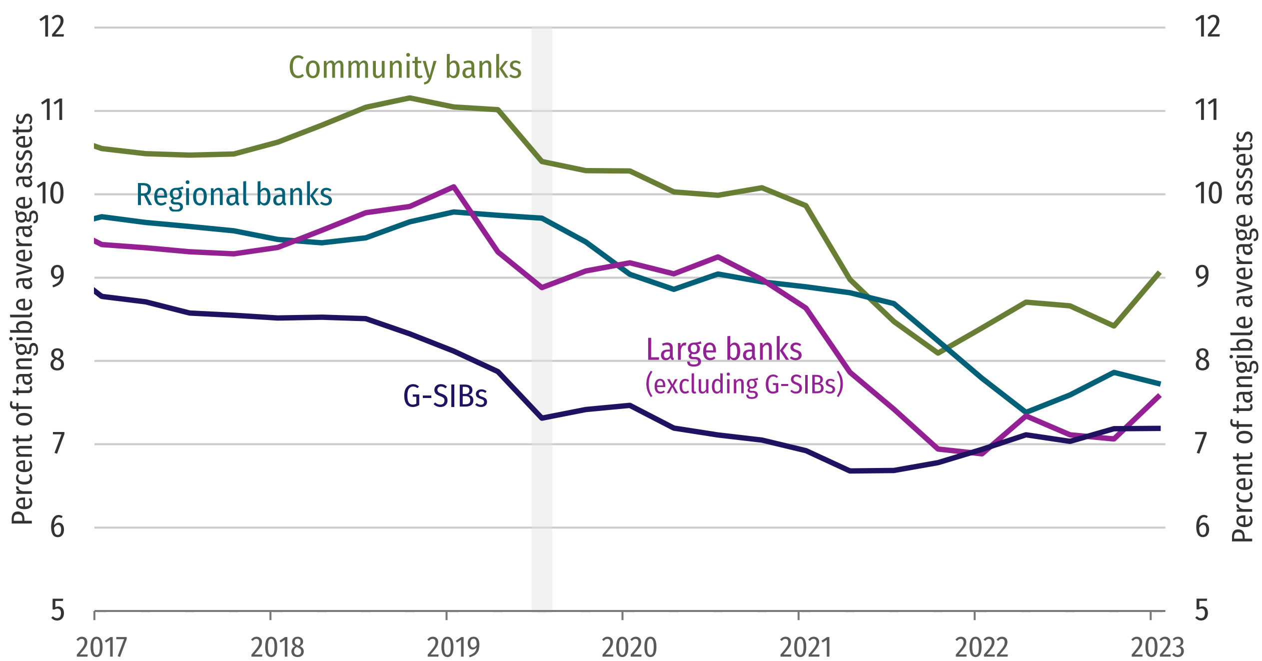
*The Federal Reserve's temporary rule to exclude reserves and U.S. Treasury securities from the leverage exposure measure of the SLR applied from 2Q 2020 to 1Q 2021.
Sources: Federal Reserve Y-9C Reports and FFIEC Call Reports.

Chart S.3
Unrealized Gains and Losses on Securities by Bank Portfolio Group



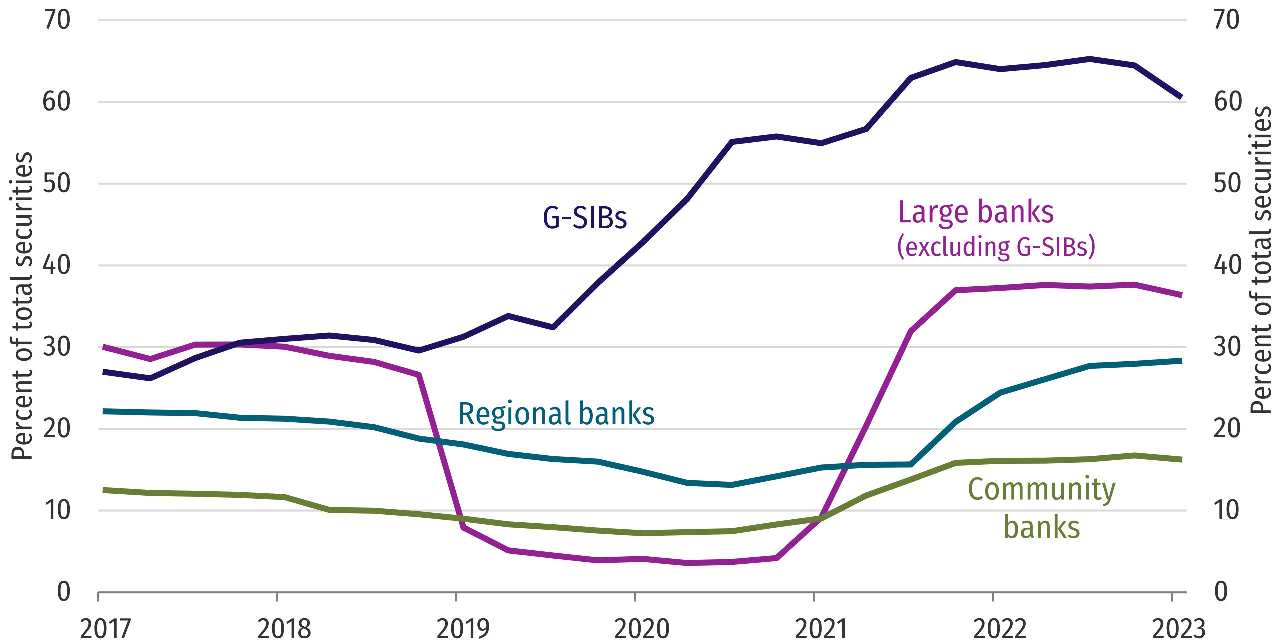
Note: Unrealized gains and losses are calculated as fair value less amortized cost, which does not reflect tax effects.
Sources: Federal Reserve Y-9C Reports for G-SIBs, LBOs and RBOs and FFIEC Call Reports for CBOs.

Chart S.4
TCE Ratio by Bank Portfolio Group



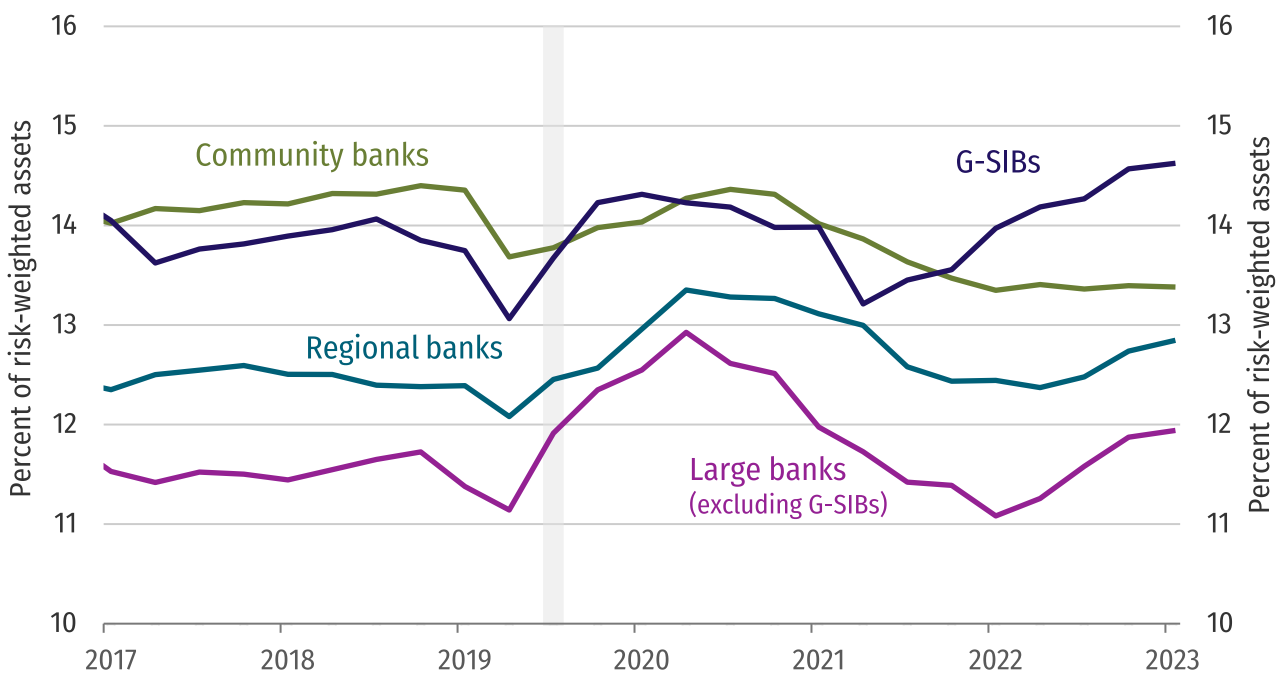
Notes: The TCE ratio is calculated as tangible common equity to tangible average assets. Gray shaded bar denotes recession.
Sources: Federal Reserve Y-9C Reports for G-SIBs, LBOs and RBOs and FFIEC Call Reports for CBOs.

Chart S.5
HTM Securities by Bank Portfolio Group



Sources: Federal Reserve Y-9C Reports for G-SIBs, LBOs and RBOs and FFIEC Call Reports for CBOs.

Chart S.6
Tier 1 RBC Ratio by Bank Portfolio Group



Notes: Gray shaded bar denotes recession.
Sources: Federal Reserve Y-9C Reports for G-SIBs, LBOs and RBOs and FFIEC Call Reports for CBOs.