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Bank Health and Future Commercial Real Estate Losses

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The three large bank failures in 2023 exposed how vulnerable banks are to unrealized securities losses and the rapid exit of uninsured deposits. Nearly one year later hundreds of banks still have large unrealized securities losses and uninsured deposits that may be vulnerable to significant commercial real estate (CRE) loan losses. This brief assesses which banks are more vulnerable to CRE loan losses. If future CRE loan losses approach levels reached in prior downturns, many banks might have combined CRE loan losses and unrealized securities losses that exceed their shareholders' equity.

Generally, banks are heavily invested in CRE debt.[1] Today, however, a sizable number of banks have CRE concentrations that have proved problematic in the past. Without steps to reduce their CRE exposure, these banks are at additional risk for CRE loan losses if the office sector continues to underperform and impair CRE loan credit quality.

Uncertainty over the resilience of banks to CRE loan losses could cause investors and depositors to lose confidence in financially vulnerable banks. For months after the three large bank failures in 2023, many investors and depositors pressured regional banks and moved their funds to the safety of the largest banks. Today's financially vulnerable banks could experience a similar negative turn in sentiment and deposit outflows.

This brief assesses which banks are more vulnerable to CRE loan losses, extending existing research on the continued consolidation of the office sector and banks' solvency risk from unrealized securities losses.[2] The analysis shows that if CRE loan losses approached levels experienced in prior CRE downturns, hundreds of banks could have CRE loan losses and unrealized securities losses that exceed their shareholders' equity. In addition, this condition can exist in an improved interest rate environment.

CRE Downturns and Bank Failures

CRE, which includes the office, retail, industrial, and hotel subsectors, is cyclical; since 1987, five downturns coincided with recessions or higher interest rate environments (see **Figure 1**). Banks are heavily invested in CRE debt and, as of Q4 2023, held $2.2 trillion in CRE loans (including $406 billion of CRE construction loans), comprising 9% of total assets. Although several factors contribute to bank failures, CRE loan losses have been the catalyst for most bank failures during the periods 2008-11 and 1987-90.[3]

The Office Sector Is Weighing Down CRE Performance

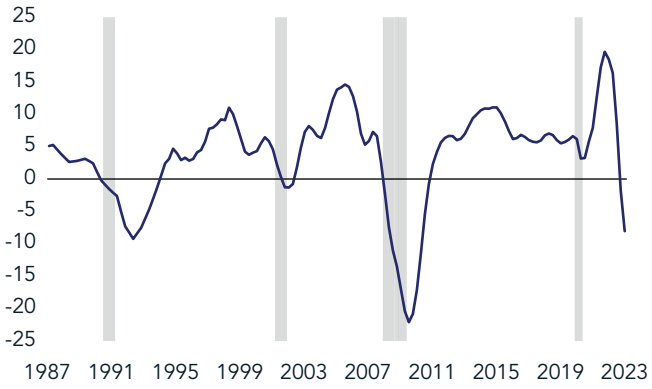
Currently, CRE is experiencing a modest cyclical downturn due to higher interest rates and less liquidity; however, the office sector is weighing down CRE performance. The office sector is underperforming because of structural consolidation resulting from work from home (WFH) initiatives: firms are reducing their office space requirements when leases renew. Because lease renewals are staggered, the cumulative effect of WFH will not be felt for several years. Nevertheless, vacancies are increasing in the office sector. Also, the sector's lower valuation and cash flows have caused delinquencies and defaults to rise. The stock market performance of office REITs reflects the WFH consolidation in the office sector (see **Figure 2**). Since the beginning of 2020, the price of office REITs declined 52%. In comparison, the price of industrial REITs increased 33%.

How Many Banks Are Vulnerable to CRE Loan Losses?

This analysis uses CRE loan exposure as well as some of the financial conditions predicate to the failure of Silicon Valley Bank (SVB), Signature Bank (SB), and First Republic Bank (FR-B) in 2023 to assess bank vulnerability to CRE loan losses. A bank is considered vulnerable if it has higher-than-average CRE loan exposure, significant unrealized securities losses, and a high level of unsecured deposits. Vulnerable banks are identified and individually assessed using publicly available call report data.

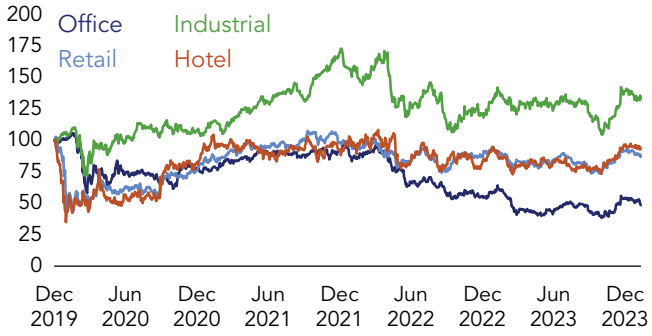
1. *CRE Loan Exposure.* The data indicate that small banks with $1 billion or less of assets tend to have higher CRE loan concentration. As of Q4 2023, 102 small banks with $109 billion in combined assets have a ratio of CRE loans-to-assets of 50% (see **Figure 3**). In addition, 2,006 larger banks with $3.1 trillion of assets have an average CRE concentration of 25% or more. The average asset size of these two cohorts is $1.0 billion and $1.5 billion, respectively. In contrast, the 14 banks with over $250 billion of assets have an average CRE-to-assets ratio of 4%.

Figure 1. Change in CRE Value (percent)



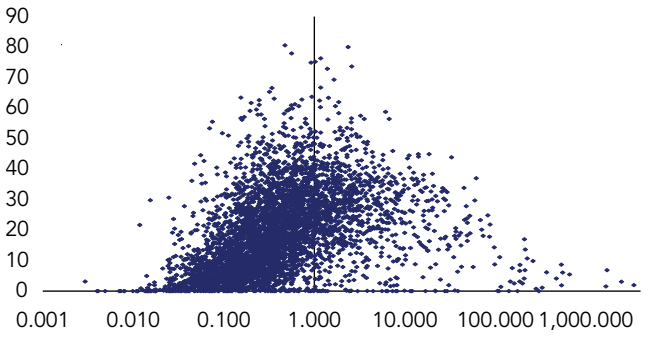
Note: Change is year-over-year. Shaded area indicates recession.
Sources: MSCI Real Capital Analytics, Authors' analysis

Figure 2. Change in NAREIT Real Estate Indices (index)



Note: 12/31/2019 = 100
Sources: Bloomberg, Authors' analysis

Figure 3. Q4 2023 Bank Assets ($ billions) and CRE Loans-to-Total Assets (percent)



Note: Total assets shown on a logarithmic scale on the x-axis. Includes 4,530 banks reporting financial data from Q4 2020 to Q4 2023.
Sources: FFIEC, Authors' analysis

2. *Significant Unrealized Securities Losses.* A high concentration of CRE loans does not necessarily put a bank at risk, even in a deteriorating CRE credit environment. A bank may have a well-diversified, conservatively underwritten, CRE loan book. However, many banks with high CRE concentrations also have large unrealized securities losses. For example, as of Q4 2023, 185 banks with $524 billion of assets had unrealized securities losses that exceeded their shareholders' equity (see **Figure 4**). Of these, 21 banks with $21 billion of assets have a CRE concentration of 25% or more. In addition, there are 764 banks with $1.2 trillion of assets with unrealized losses equal to 75% of shareholders' equity. Of these, 120 banks with $130 billion of assets have a CRE concentration of 25% or more.

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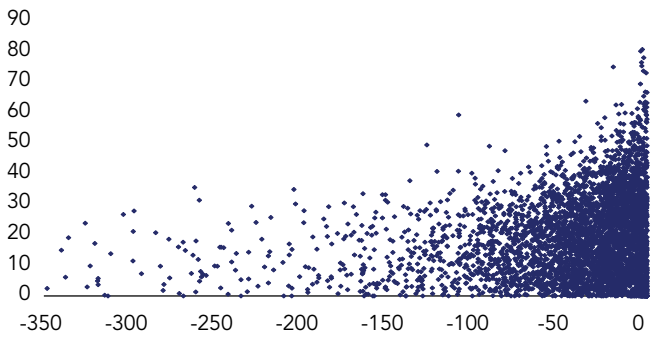
3. *Large Uninsured Deposits. Public confidence in banks is paramount to their viability.* Deposits are essentially short-term loans from depositors to banks that fund nearly 80% of banks' assets. A lack of confidence in a bank's solvency drives depositors, especially uninsured depositors, to withdraw their funds and seek safer harbors for their cash. A run on deposits destabilizes a bank because the bank is forced to deleverage or breach regulatory capital minimums. The 2023 collapses of SVB on March 10, SB on March 12, and FR-B on May 1 triggered a wider lack of confidence in banks, especially regional and smaller banks. These bank failures stressed the banking system and led to significant official-sector intervention to prevent runs from spreading to similarly situated banks and destabilizing the broader financial system.[4]

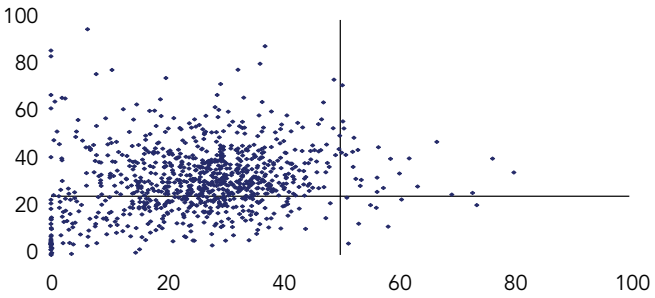
Many banks with high CRE concentrations also have a high proportion of uninsured deposits. As of Q4 2023, at least 81 banks have an uninsured deposits ratio of 50% or higher (see **Figure 5**), which is greater than FR-B's uninsured deposit ratio of 48% in the quarter prior to its failure in May 2023. In addition, at least 54 banks with $187 billion in assets also have a CRE concentration of 25% or more and an uninsured deposit ratio of 50% or higher.

Figure 4. Q4 2023 Bank Unrealized Securities Losses/Shareholders' Equity (percent) and CRE Loans/Assets (percent)



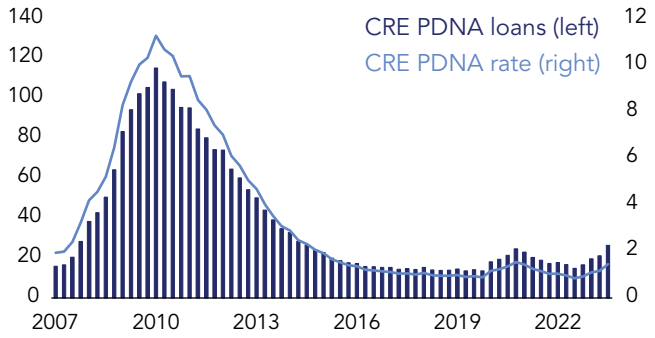
Note: Includes 4,530 banks. An x-axis value of -100% or less means that a bank's unrealized securities losses exceeds its shareholder's equity.
Sources: FFIEC, Authors' analysis

Figure 5. Q4 2023 Uninsured Deposits/Deposits (percent) and CRE Loans/Assets (percent)



Note: Uninsured deposits/deposits is shown on the x-axis. Includes the 952 banks that report uninsured deposits.
Sources: FFIEC, Authors' analysis

Figure 6. PDNA Loans ($ billions) and PDNA Rate (percent)



Note: PDNA loans are past due and non-accrual.
Sources: FFEIC, Authors' analysis

Deterioration of the Credit Quality of CRE Loans

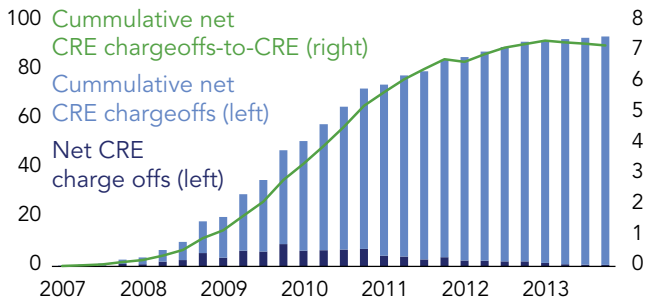
The recent deterioration of the credit quality of bank CRE loans is indicated by the increase in past due and non-accrual (PDNA) CRE loans. As of Q4 2023, the amount of PDNA CRE loans increased to $28.7 billion, up $12.0 billion or 72% from the beginning of the year. These loans had a PDNA rate of 1.28%, up from 0.77% from a year ago, which is also the highest PDNA rate for bank CRE loans since Q3 2015 (see **Figure 6**). Currently, aggregate CRE net charge-offs remain low at less than $1 billion. However, net charge-offs tend to lag the growth of PDNA loans, and during a CRE downturn, these loan losses can be severe. During the 2007 to 2009 financial crisis, the loan loss severity as indicated by the PDNA rate was not realized for several years, and cumulative net CRE loan losses rose to $93 billion, equivalent to a 7.3% CRE net charge-off rate (see **Figure 7**).

Estimated CRE Loan Losses

Although the level of future CRE loan losses is uncertain, we can gauge the severity of future losses by basing CRE loan loss estimates on historical net charge-off rates. For example, CRE loan losses peaked at 7.3% during the 2007-2009 financial crisis. If banks experienced that loan loss rate today, banks in aggregate would recognize a $163 billion charge-off. If the loan loss rate were at about half that at 4%, then banks would post an $89 billion impairment.

We can use these loan loss estimates to identify vulnerable banks under different loan loss rates by solving for the future cumulative CRE loan loss rate such that CRE loan losses plus unrealized securities losses exceed a bank's shareholders' equity. As of Q4 2023, 185 banks with $524 billion of assets had unrealized securities losses that exceeded their shareholders' equity (see **Figure 8**). Should the CRE loan loss rate reach 4%, 229 banks with $542 billion of assets and $19 billion of CRE loans would have realized CRE loan losses and unrealized securities losses greater than their equity. Should the CRE loan loss rate reach 8%, which is slightly above the 2007 to 2009 financial crisis peak, 278 banks with approximately $614 billion of assets and $38 billion of CRE loans would have realized and unrealized losses greater than their shareholders' equity.

Figure 7. Net and Cumulative Net CRE Charge-offs ($ billions) and Cumulative Net Charge-off Rate (percent)



Sources: FFEIC, Authors' analysis

Figure 8. Q4 2023 CRE Summary Statistics Across Loan Loss Rate Thresholds

CRE Loan Loss Rate (percent)	No. of Banks	Assets ($ billions)	CRE Loans ($ billions)	CRE Loans/ Assets (percent)
0	185	524	15	3
0 to 2	16	5	1	17
2 to 4	28	13	3	22
4 to 6	20	25	8	33
6 to 8	29	46	10	22
8+	4,252	23,011	2,195	10
Total	**4,530**	**23,625**	**2,233**	**9**

Sources: FFIEC, Authors' analysis

The 278 vulnerable banks are generally smaller, with $1 billion or less of assets, and primarily operate in suburban and rural locations in the Midwest and South. The Midwest region has 102 vulnerable banks with $50 billion of assets, while the South has 141 banks with $494 billion of assets (see **Figure 9**). Notably, fewer vulnerable banks are located in the Northeast and Pacific. The New England census region has no

Figure 9. Geographic Distribution of Banks Vulnerable to CRE Loan Losses, Q4 2023

Census Region	No. of Banks	Assets ($ millions)	Liabilities ($ millions)	Share-holders' Equity ($ millions)	CRE Loans ($ millions)	CRE Loans/ Assets (percent)	Fair Value - Amortized Cost of Securities		Unsecured Deposits (percent)
							Total ($ millions)	Percent	
Northeast									
New England	-	-	-	-	-	-	-	-	-
Middle Atlantic	12	14,720	14,039	681	2,982	20	-1,128	-16	38
Midwest									
East North Central	35	12,065	11,519	546	1,989	16	-627	-12	42
West North Central	67	37,629	35,862	1,768	5,415	14	-2,312	-12	37
South									
South Atlantic	33	20,493	19,451	1,042	5,641	28	-1,024	-14	34
East South Central	41	21,037	19,943	1,095	4,415	21	-1,361	-15	30
West South Central	67	452,007	430,804	21,203	7,403	2	-26,938	-9	12
West									
Mountain	17	38,703	36,791	1,913	6,401	17	-1,862	-12	25
Pacific	6	17,386	16,516	870	3,372	19	-1,153	-13	64
Total	**278**	**614,041**	**584,923**	**29,117**	**37,619**	**6**	**-36,405**	**-10**	**19**

Sources: FFIEC, Authors' analysis

vulnerable banks. Many of the 278 vulnerable banks have significant loan CRE concentration, with 57 having CRE loans equal to 25% or more of total assets while nearly all have large unrealized securities losses. Of the 37 vulnerable banks that report uninsured deposits, 18 banks have an uninsured deposits-to-total deposits ratio of 33% or higher, and seven have an uninsured deposits-to-total deposits ratio of 50% or higher.

The vulnerable banks are concentrated in three states: Texas in the West South Central census region (43 banks with $442 billion of assets); Alabama in the East South Central census region (20 banks with $9 billion of assets), and Minnesota in the West North Central census region (19 banks with $6 billion of assets). Within these three states, 33 banks have significant CRE loan concentrations with CRE loans equal to 25% or more of total assets. Their CRE loan performance appears to be below average for banks. The Q4 2023 aggregate average PDNA rate of these loans is 1.94%, compared to the aggregate bank average of 1.28%.

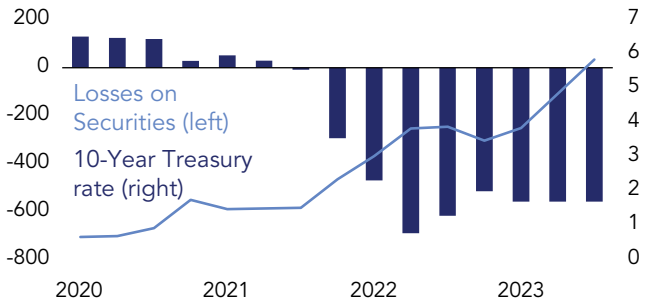
The Effect of Changing Interest Rates on Unrealized Securities Losses

Banks' securities portfolios are largely comprised of long-dated, fixed-rate debt securities.[5] As a consequence, the change in the fair value of banks' securities portfolios is negatively correlated with rising interest rates.[6] Through year-end 2021, when the top of the federal funds rate target range and the discount rate were 0.25%, the fair value of bank's securities was greater than their amortized cost.[7] The Federal Open Market Committee (FOMC) began raising interest rates on March 16, 2022. By July 26, 2023, the top of the federal funds rate target range and the discount rate were at 5.50%. These rate hikes created significant fair-value losses in banks' securities portfolios (see **Figure 10**). For Q4 2023, aggregate bank unrealized securities losses were $478 billion.

At the beginning of 2024, many observers believed that the FOMC may ease interest rates during 2024.[8] More recent economic data may have curbed early exuberance for rate cuts as consensus has now shifted to a more cautious outlook.[9] Lower interest rates would reduce bank securities losses lessening their vulnerability; higher rates would increase securities losses and expand the cohort of vulnerable banks. To account for changing future interest rates, we project the fair value of a bank's securities portfolio under different interest rate scenarios using the critical equity rate methodology described in "Some U.S. Banks May Remain Vulnerable to Losses in Their Securities Portfolios: Introducing Two New Forward-looking Metrics to Assess Future Risk" (Doolittle & Young (2023)).[10]

The aggregated results are displayed in **Figure 11**. As of Q4 2023, banks' unrealized securities losses were $477 billion (a 9% fair value discount) with the 10-year Treasury rate at 4.057%. Every 50-basis-point change

Figure 10. Unrealized Securities Losses ($ billions) and 10-Year Treasury Rate (percent)



Sources: FFEIC, Bloomberg, Authors' analysis

Figure 11. Q4 2023 Interest Rate Sensitivity Table Showing Change in Unrealized Securities Losses

10-Year Treasury Rate (percent)	Change in Treasury Rate (percent)	Securities			
		FV ($ billions)	AC ($ billions)	FV-AC ($ billions)	FV/AC (percent)
5.057	1.0	4,920	5,629	-709	-14
4.557	0.5	5,036	5,629	-593	-12
4.057	0.0	5,152	5,629	-477	-9
3.557	-0.5	5,268	5,629	-361	-7
3.057	-1.0	5,384	5,629	-245	-5
2.557	-1.5	5,500	5,629	-129	-2
2.057	-2.0	5,616	5,629	-13	0

Note: FV is fair value; AC is amortized cost.
Sources: FFEIC, Authors' analysis

in the 10-year Treasury rate generates a $118 billion change in the aggregate fair value of banks' securities.[11] If the 10-year rate fell 100 basis points to 3.057%, the August 2022 level, banks' unrealized securities loss would fall to $245 billion, a 5% discount. If, instead, the 10-year rate rose 100 basis points to 5.057%, near its October 2023 level, banks' unrealized securities loss would increase to $709 billion, a 14% discount.

We now recalculate the future cumulative CRE loan loss rate such that CRE loan losses plus unrealized securities losses exceed a bank's shareholders' equity, individually bank-by-bank, under different interest rate scenarios. For illustrative purposes, the aggregate results for two of the scenarios, a 100-basis-point decrease and a 100-basis-point increase in the 10-year Treasury rate, are shown in **Figure 12**.

In the 100-basis-point decrease scenario, even with no CRE loan losses, 62 banks with $28 billion of assets would have unrealized securities losses that exceed their shareholders' equity. Should the CRE loan loss rate reach 4%, 80 banks with approximately $45 billion of assets and $8 billion of CRE loans would have realized CRE loan losses and unrealized securities losses greater than their equity. Should the CRE loan loss rate reach 8%, 112 banks with approximately $67 billion of assets and $13 billion of CRE loans would have realized and unrealized losses greater than their shareholders' equity.

In the less likely scenario where rates increase by 100 basis points and there are no CRE loan losses, 337 banks with $288 billion of assets would have unrealized securities losses that exceeded their shareholders' equity. Should the CRE loan loss rate reach 4%, 438 banks with $412 billion of assets and $60 billion of CRE loans would have realized CRE loan losses and unrealized securities losses greater than their equity. Should the CRE loan loss rate reach 8%, 519 banks with $477 billion of assets and $77 billion of CRE loans would have realized and unrealized losses greater than their shareholders' equity.

Conclusion

Many banks remain pressured by conditions like those that precipitated the three large 2023 bank failures, including large unrealized losses in their securities and significant levels of uninsured deposits. The prospect of CRE loan losses adds another layer of risk to already vulnerable banks, especially smaller banks with $1 billion or less of total assets. Even accounting for potentially lower interest rates during the year,

Figure 12. +100/-100-Basis Points Shock to 10-Year Treasury Rate and CRE Loan Loss Rate such that CRE Loan Losses Plus Unrealized Securities Losses Exceed Shareholder's Equity (Q4 2023)

CRE Loan Loss Rate (percent)	100-Basis-Point Decrease (3.057%)				100-Basis-Point Increase (5.057%)			
	No. of Banks	Assets ($ billions)	CRE Loans ($ billions)	CRE Loans/ Assets (percent)	No. of Banks	Assets ($ billions)	CRE Loans ($ billions)	CRE Loans/ Assets (percent)
0	62	28	3	12	337	288	30	10
0 to 2	10	13	3	25	56	69	15	22
2 to 4	8	4	1	24	45	55	14	25
4 to 6	10	4	1	21	51	32	9	27
6 to 8	22	18	4	25	30	32	8	26
8+	4,418	23,558	2,220	9	4,011	23,148	2,156	9
Total	**4,530**	**23,625**	**2,233**	**9**	**4,530**	**23,625**	**2,233**	**9**

Sources: FFEIC, Authors' analysis

hundreds of banks with hundreds of billions of total assets are at risk unless they sufficiently reduce the CRE exposure or build their resilience.

The analysis described in this brief allows industry observers to identify banks that are vulnerable to CRE loan losses under different interest rate environments. This approach combined with measures of uninsured deposit levels serves as a manner of assessing vulnerable banks. Had the approach been applied to SVB in the second half of 2022, it would have signaled a significant risk of failure up to nine months before SVB's collapse.

Endnotes

1 "Commercial/Multifamily Debt Outstanding Q3 2023." Mortgage Bankers Association. (December 14, 2023). https://www.mba.org/docs/default-source/research-and-forecasts/cmf-mdo/3q23mortgagedebtoutstanding.pdf.

2 Doolittle, Thomas and Fliegelman, Arthur. "Work-from-Home and the Future Consolidation of the U.S. Commercial Real Estate Office Sector: The Decline of Regional Malls May Provide Insight" Brief no. 23-03, Washington, DC. Office of Financial Research. August, 2023. https://www.financialresearch.gov/briefs/2023/08/24/work-from-home-and-commercial-real-estate/.

Young, Peyton and Doolittle, Thomas. "Some U.S. Banks May Remain Vulnerable to Losses in Their Securities Portfolios: Introducing Two New Forward-looking Metrics to Assess Future Risk." Brief no. 23-04, Washington, DC. December, 2023. https://www.financialresearch.gov/briefs/2023/12/27/two-new-metrics-bank-securities-portfolio-risk/

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4 In March 2023, the U.S. government invoked the systemic risk exception to the least cost resolution requirement for failing banks. The purpose was to protect all depositors, including uninsured depositors, following the failures of Silicon Valley Bank (SVB) and Signature Banks failures. For more information, see "The FDIC's Systemic Risk Exception." Congressional Research Service. (April 11, 2023). https://crsreports.congress.gov/product/pdf/IF/IF12378.

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6 See discussion of critical equity rate in Young, Peyton and Doolittle, Thomas. "Some U.S. Banks May Remain Vulnerable to Losses in Their Securities Portfolios: Introducing Two New Forward-looking Metrics to Assess Future Risk." Brief no. 23-04, Washington, DC. December, 2023. https://www.financialresearch.gov/briefs/2023/12/27/two-new-metrics-bank-securities-portfolio-risk/.

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10 Young, Peyton and Doolittle, Thomas. "Some U.S. Banks May Remain Vulnerable to Losses in Their Securities Portfolios: Introducing Two New Forward-looking Metrics to Assess Future Risk." Brief no. 23-04, Washington, DC. December, 2023. https://www.financialresearch.gov/briefs/2023/12/27/two-new-metrics-bank-securities-portfolio-risk/

11 The price of bonds changes inversely with interest rates because the discounted presented value a bond's cash flows falls when interest rates increase.