

Life insurers' exposure to commercial real estate

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Introduction and summary

Life insurers have significant exposure to commercial real estate (CRE) primarily through direct mortgage lending and commercial mortgage-backed securities (CMBS). These investments help life insurers match their long-duration liabilities with long-duration assets. As of 2022:Q4, commercial mortgages in life insurers' portfolios stood at \$600 billion, and hence, were their third-largest asset class, accounting for about 16% of the insurers' total investments and about 14% of general account assets (figure 1).¹ Life insurers are also indirectly exposed to CRE through their investments in CMBS, which stood at about \$170 billion in 2022:Q4. Recent developments in the CRE market, such as the shift to more people working from home following the Covid-19 pandemic resulting in lower demand for office space, as well as higher interest rates, have put pressure on commercial property values. Given their significant CRE exposures, life insurers could potentially experience significant losses if CRE prices deteriorate.



Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.

In this article, we provide a comprehensive and detailed analysis of life insurers' CRE exposures and their implications for financial stability.² For this purpose, we analyze the geographic concentration of CRE mortgage lending by life insurers. We then provide a scenario analysis, in which we estimate losses based on property price forecasts from the commercial real estate industry. Lastly, we assess insurers' stock responses around two events in the banking sector that raised concerns about CRE exposures.

We start with documenting that life insurers extend commercial mortgages primarily to suburban locations (\$488 billion) rather than for commercial buildings in central business districts (about \$109 billion).³ The exposure is also not overly concentrated in large metropolitan areas. For instance, life insurers' exposure to New York/ Manhattan is \$40 billion. More generally, we

show that life insurers' CRE mortgage portfolios exhibit a high degree of geographical diversification. We also document that current and at origination loan-to-value (LTV) ratios are low for CRE mortgages compared to those for residential mortgages.

Life insurers are also exposed to CRE through their \$170 billion CMBS holdings. About 80% of life insurers' CMBS holdings are senior (AAA-rated) tranches; life insurers rarely invest in below investment-grade CMBS tranches. Next, we document that the CRE exposure life insurers gain through CMBS is systematically different from their own commercial mortgage underwriting. Specifically, while mortgages in CMBS are also mostly in suburban locations, the downtown exposure of CMBS is strongly tilted toward office buildings. In addition, the LTV of the mortgages in CMBS is on average higher than that of the commercial mortgages underwritten by insurers. These differences suggest that despite investing in highly rated CMBS tranches, life insurers could potentially incur losses from their CMBS holdings.

Next, we conduct a scenario analysis in which we use projected declines in CRE prices as a "shock" and consider widespread strategic default of borrowers.⁴ Specifically, we use projections of changes in prices by geography and property type between 2020 and 2025 from Global Commercial Real Estate Services (CBRE). We then assume that all loans default, capturing the fact that recently borrowers walked away from properties with negative cash flow or equity well before maturity, and calculate life insurer losses as the amount of mortgage balances in excess of the shocked property price.⁵

In this scenario analysis, we estimate that life insurers would suffer a \$10 billion loss from their commercial mortgage portfolios. The average loss is about 1.1% of capital, with more than one quarter of life insurers experiencing no losses. With few exceptions, insurers' losses are less than 10% of their capital.

To shed light on whether losses stemming from life insurers' commercial loan portfolio could result in significant funding disruptions for life insurers, we also consider run risk. Specifically, we assess whether life insurers with large estimated losses in the scenario analysis also have a large share of *runnable* liabilities, defined as annuities that can be surrendered without penalty and nontraditional liabilities.⁶ We find that only two large (greater than \$10 billion in assets) life insurers have losses over 5% of their capital and a share of runnable liabilities of over 50%.

Next, we consider losses from life insurers' CMBS holdings. We obtain CUSIP-level price data from the Financial Industry Regulatory Authority's Trade Reporting and Compliance Engine (TRACE).⁷ To estimate CMBS-related losses, we take the lowest quarterly average price for each CUSIP (a code that identifies individual financial securities) between 2021:Q1 and 2024:Q1 to account for the possibility of runs and fire sales. The main reason for this assumption is that the lowest price over this period likely captures the price floor of these securities and hence, will provide an upper bound for losses. With this assumption, we estimate that life insurers would suffer about \$26.3 billion in losses from their CMBS holdings, mostly driven by the interest rate environment rather than credit losses. We find that CMBS-related losses would exceed 15% of capital for several large insurers.

Combining estimated commercial mortgage and CMBS holding losses amount to about \$36.3 billion in total losses. We find that under our price scenario five large insurers—insurers with \$10 billion assets or more—would experience losses of more than 20% of their adjusted capital, and several insurers may face heightened regulatory scrutiny and have to raise capital. However, most insurers with large estimated losses have only a small share of runnable liabilities, mitigating concerns about potential runs triggered by CRE-related losses.

To further investigate concerns about life insurers' solvency stemming from CRE-related concerns, we assess whether financial market participants expected life insurers to suffer large losses due to their CRE exposure. We analyze two specific episodes that highlighted problems in the CRE space: the failure of Silicon Valley Bank (SVB) and the earnings announcement of New York Community Bancorp (NYCB), in which the parties reported large losses from commercial real estate loans. Life insurers with larger CRE

exposure or large losses in the scenario analysis did not have more negative stock returns, suggesting that market participants did not consider life insurers' CRE exposures a salient risk.

This article contributes to the literature on life insurance portfolios. Most of the literature has focused on bond investments.⁸ Koijen and Yogo (2023b) show that life insurers' bond investments can be rationalized with insurers' cheap access to leverage. Becker, Opp, and Saidi (2022) show how capital requirements affect life insurers' bond investments. Kirti and Sarin (2024) document that life insurers that were taken over by private equity firms shifted their investments toward private-label asset-backed securities (ABS). Foley-Fisher, Heinrich, and Verani (2023) show that over the past decade, insurers have also significantly increased their securitization activity and issued collateralized loan securities (CLO). We complement this literature by providing a comprehensive analysis of the insurers' exposure to CRE, which accounts for about 16% of the portfolio.

We also contribute to the literature on financial system vulnerabilities and systemic risk in the life insurance market. Chiang and Niehaus (2020) show that correlated trading of life insurers affects bond prices. Girardi et al. (2021) extend this theme and document that life insurers have similar portfolios. These similarities also predict common sales, which in extreme events result in significant price impacts. Ellul et al. (2022) show that life insurers' rate guarantees can lead to insurance industry-wide fire sales. Jiang et al. (2023a) provide estimates for CRE-related losses in the banking sector after the Covid-19 pandemic based on CMBS price declines. We provide an estimate of insurers' CRE-related losses based on loan-level data and detailed price forecasts and gauge the risks to financial stability by assessing whether insurers with significant estimated losses rely on runnable liabilities to fund themselves.

Our study also relates to the literature on differences across underwriters in the commercial mortgage market. Black, Krainer, and Nichols (2017) focus on differences between banks and CMBS and document that banks hold commercial mortgages with less-standard terms. Glancy, Kurtzman, and Loewenstein (2022) also document significant differences across underwriters, showing that banks and insurers generally have lower-at-origination LTVs than commercial mortgages in CMBS. Black, Krainer, and Nichols (2020) contrast commercial mortgage outcomes during the 2008 financial crisis, depending on whether the mortgage was originated by banks and CMBS.⁹ We contribute to this literature by documenting that life insurers' underwriting terms and geographical concentration differ significantly from CMBS. We show that life insurers' CRE mortgage portfolios are broadly diversified and do not exhibit a high degree of home bias. Moreover, we document that the portfolios are not overly skewed to large metropolitan statistical areas or downtown locations.

Data

We obtained detailed data on insurers' commercial mortgage holdings, CUSIPs of CMBS holdings, and other insurer balance-sheet information from the National Association of Insurance Commissioners' (NAIC) statutory filings provided by S&P Global Market Intelligence. For commercial mortgages, we use the reported zip codes for location and value assessments for prices when constructing LTVs.

We use city property-type commercial real estate price forecasts from CBRE to calculate stressed commercial real estate prices by location and property type. The data include prices for lodging, industrial, office, multifamily, and retail for 91 markets. We match these price forecasts to the aforementioned commercial mortgages using a market-zip code crosswalk.

We use zip code submarket descriptions obtained from CBRE to distinguish between suburban and downtown markets. We aggregate downtown and suburban designations at the submarket



Note: For simplicity, we assigned foreign loans to suburban locations.

Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.

Commercial mortgages

level to the zip code level, such that if any of the submarkets for a given zip code are labeled "downtown," then the entire zip code is labeled as downtown. A zip code is treated as "suburban" if and only if the zip code has no submarkets considered downtown.

We obtain CMBS prices from reported trades from TRACE, location of properties backing mortgages in CMBS from Trepp, CMBS price indexes from Bloomberg, and stock returns from the Center for Research in Security Prices (CRSP).

Life insurers' exposure to commercial real estate

In this section, we provide a detailed overview of life insurers' direct and indirect exposures to commercial real estate. We start with direct lending (commercial mortgage) and analyze the loan terms and geographic diversification. We then review the life insurers' holdings of CMBS.

As of 2022:Q4, life insurers held \$596.6 billion commercial mortgages in their portfolio. Figure 2 shows that the majority of commercial mortgages in life insurers' portfolios finance properties in suburban locations. While life insurers have significantly increased their overall CRE lending over the last decade, much of this increased lending activity focused on suburban locations rather than office-dominated downtown locations.

Figure 3 provides more details on the loan terms of the 60,337 commercial mortgages that life insurers held in 2022:Q4 to better understand the potential risks stemming from the commercial mortgage portfolios. The current and at-origination loan-to-value ratios are on average 0.53 and 0.54, respectively, much

5. Summary statistics of commercial mortgages in me insurers portionos in 2022								
	Number of loans	Total mortgage balances (billions of dollars)	Average remaining maturity (years)	Average interest rate (percent)	Average current loan- to-value ratio	Average at-origination Ioan-to-value ratio		
All	60,337	596.6	7.3	4.26	0.53	0.54		
Downtown	5,152	108.6	6.9	4.42	0.56	0.52		
Suburban	55,185	488.0	7.4	4.22	0.52	0.55		

3. Summary statistics of commercial mortgages in life insurers' portfolios in 2022

Notes: The current loan-to-value ratio is calculated as the current loan balance divided by the latest assessed value. Assessments reflecting recent price declines increase loan-to-value ratios. For simplicity, we assigned foreign loans to suburban locations.

Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.

4. Loan-to-value ratio distribution in 2022

	Average	10th percentile	25th percentile	Median	75th percentile	90th percentile
All	0.53	0.18	0.34	0.48	0.59	0.67
Downtown	0.56	0.18	0.37	0.51	0.61	0.70
Suburban	0.52	0.18	0.34	0.48	0.59	0.67

Notes: The current loan-to-value ratio is calculated as the current loan balance divided by the latest assessed value. Assessments reflecting recent price declines increase loan-to-value ratios. For simplicity, we assigned foreign loans to suburban locations.

B Downtown locations

Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.



5. Commercial mortgages by property type



Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.

lower than for residential mortgages, suggesting more conservative underwriting practices. Moreover, these loans had, on average, a remaining maturity of about seven years. In other words, a significant share of commercial loans in life insurers' portfolios will not have to be repaid in the near future. The low LTVs imply that insurers will only face significant losses in the case of large price declines.

We also split the commercial mortgage sample into central business district (downtown) and suburban locations as downtown locations are expected to have more significant price declines. Downtown mortgages account for about 18% of the commercial mortgage portfolios. These mortgages have a somewhat shorter remaining maturity (6.9 years on average) and have slightly higher LTV ratios (0.56) than mortgages backed by buildings in suburban locations, which have an average remaining maturity of 7.4 years and an LTV of 0.52.10

One concern is that the average LTV masks a sizable share of commercial mortgages with high LTVs. We therefore show the current LTV distribution in more detail in figure 4. We find that even for the higher percentiles of the distribution, the LTVs are comparatively low for the suburban locations—0.59 for the 75th percentile and 0.67 for the 90th percentile. For mortgages backed by downtown properties, the LTVs

6. Geographical diversification of commercial mortgages



A. Distance from headquarters

B. Exposure to largest metropolitan statistical areas



Note: In 2022, for 7,384 loans with total balances of about \$74 billion, we could not assign geographical coordinates and hence, these loans are missing from panel A.

Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.

are slightly higher, especially on the high end of the LTV distribution, although even there LTVs barely breach 0.70.

Next, we assess whether life insurers' CRE direct exposure is concentrated in specific property types to gauge whether life insurers are vulnerable to the large declines in office building prices anticipated by market observers.¹¹ Figure 5, panel A, shows that life insurers' exposure to office building prices in suburban locations is limited, as a large share of these loans is backed by multifamily, industrial, and retail buildings. The downtown exposure, however, is concentrated in the office and multifamily segments (figure 5, panel B).

Last, we consider the geographical diversification to assess whether life insurers' portfolios are highly concentrated near their headquarters' locations. Figure 5, panel A shows that insurers' commercial mortgage portfolios exhibit significant geographical diversification. Specifically, there is little evidence of a home bias in commercial mortgages. Most commercial mortgages are extended to locations far away from the insurance companies' headquarters.¹²

Figure 6, panel B, shows the life insurance sector's exposure to commercial mortgages by selected geographies. While insurance companies have significant exposures to the Manhattan and Los Angeles markets (about \$40 billion and \$32 billion, respectively), they have less exposures to other large CRE markets with potentially significant price declines (Chicago, San Francisco). In sum, life insurers' direct exposure to CRE appears to be geographically well diversified.

Taken together, life insurers' commercial mortgage portfolios exhibit modest LTVs and appear to be well diversified geographically and by property type, although downtown locations exhibit a significant exposure to the office segment.

7. Characteristics of life insurers' commercial mortgage-backed securities (CMBS)



Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence and Trepp.

CMBS holdings

Life insurers have additional exposure to CRE through their \$170 billion holdings of private-label CMBS. Within CMBS, life insurers tend to invest in the senior tranches. About 80% of insurers' CMBS holdings are AAA-rated, and insurers hold little non-investment-grade (below BBB-rated) securities (figure 7, panel A).

The indirect exposure to CRE that life insurers have through CMBS holdings differs significantly from their directly held commercial mortgages. First, directly held commercial mortgages tend to be amortizing, while CMBS mortgages typically have balloon payments.¹³ Second, directly held mortgages have on average lower LTVs at origination. The mortgages in CMBS held by life insurers have an average LTV over 0.6. For reference, commercial mortgages originated between 2012 and 2017 exhibited significant differences in average at-origination LTVs across the lender types. Specifically, commercial mortgages originated by banks and life insurers had LTVs of 0.56 and 0.57, respectively, while commercial mortgages in CMBS had an average at-origination LTV of 0.65 (Glancy, Kurtzman, and Loewenstein, 2022). Third, as figure 7, panel B, shows, CMBS downtown mortgages have considerably more concentration in the office sector. The concentration in the downtown office segment is particularly pronounced in single-asset, single-borrower (SASB) CMBS.¹⁴ Here, 83% of the downtown mortgages are to office properties, while for conduit CMBS the respective share is 51%. Single-asset, single-borrower CMBS account for 18% of life insurers' CMBS holdings. Market-wide commercial mortgages backed by office buildings account for about 30% of loan amounts in both SASB and conduit CMBS.

Scenario analysis

In this section, we present a scenario in which we shock the commercial mortgage loans held by life insurers by taking the CBRE price forecast by location and property type and estimate losses under the assumption of widespread strategic default. We then also calculate the mark-to-market losses on the CMBS holdings. We report how much capital each insurer would lose in this scenario and assess potential run risks by analyzing whether insurers with large losses also have a significant amount of runnable liabilities.

Analysis assumptions

We stress life insurers' commercial mortgage portfolios based on the CBRE price projections. We use the change in property prices by location and property type from 2020 to 2025. For the commercial mortgage portfolios that life insurers hold, across all geographies CBRE projects an average price decline for multifamily, office, and retail of 13%, 40%, and 23%, respectively.¹⁵

We use the underlying estimated price declines by geography and property type to estimate losses for insurers.¹⁶ Taking the regional heterogeneity by property type into account is crucial since some markets are projected to experience slumping prices, especially for office properties, while other markets are projected to experience no, or only mild, price declines.¹⁷ We take a conservative approach and consider a full drop in property prices, even if the life insurers have reported updated property value assessments in 2021 or 2022. While life insurers regularly update property value assessments, most of the assessments are not as recent as 2022.¹⁸

To estimate direct CRE loan losses, we make two assumptions. First, we consider widespread strategic default, for instance, due to negative net cash flow from a property. Specifically, we put all loans into default.¹⁹ Second, we assume that the price scenarios already incorporate potential fire-sale discounts and calculate the loss-given default (LGD) for each loan as the difference between the mortgage balance and the stressed price if the mortgage balance exceeds the stressed price and zero otherwise:

1) $LGD = \max[0, Mortgage Balance - Stressed Price].$

Together, the two assumptions are equivalent to assuming that all mortgages with the stressed price have negative equity default. We then calculate the total losses for each insurer. While the assumption that all loans default is arguably extreme, the impact is potentially mitigated by the fact that many CRE loans in life insurers' portfolios have loan-to-value ratios of about 0.53.²⁰

We also calculate potential losses from CMBS holdings by using current market prices—that is, we use the current mark-to-market losses as a proxy for losses on the CMBS holdings in the future.

Results of the analysis

We start our scenario analysis with the commercial mortgage portfolio of insurers. Given our assumptions of widespread default and losses being the difference between the outstanding loan balance and the stressed price, we estimate that the U.S. life insurance sector would experience losses of about \$10 billion on its \$545 billion commercial mortgage holdings. The main reason for the relatively small losses relative to the size of the commercial mortgage portfolio is low current LTVs (figure 12 on p. 12). For the approximately 16,000 commercial mortgages for which the scenario predicts a price decline of at least 20%, the median stressed LTV is 0.78 and the 75th percentile is 0.95, limiting losses.

Figure 8 shows that exposures to the New York market account for almost a fifth of these losses, while the large exposures to the Los Angeles market are not expected to drive losses.²¹ In addition to the geographical diversification, insurers invest in CRE loans that are amortizing, and hence, the loan balance and loan-to-value ratios decrease over time, limiting the exposure of insurers to price declines in the CRE market.

8. Estimated losses for selected markets



Note: Only markets with projected losses of at least \$0.25 billion are shown.

Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence and Global Commercial Real Estate Services.

9. Commercial mortgage losses and all runnable liabilities





Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence and Global Commercial Real Estate Services.

The median insurer experiences losses of about 1% of their adjusted capital, which includes loan loss reserves. However, not all insurers are equally geographically diversified; and four life insurers would face losses of at least 10% of their capital. Insurers with large losses could face runs if they have a significant share of nontraditional, runnable liabilities, such as funding-agreement-backed securities or federal home loan bank (FHLB) advances or have a large share of annuities that can be surrendered without penalty.²² Funding-agreement-backed securities have a fixed maturity and are typically rolled over. Foley-Fisher, Narajabad, and Verani (2020) show that during the 2008 financial crisis, investors refused to roll over these agreements. FHLB advances are included as FHLB funding itself can be fragile (Gissler and Narajabad, 2017a,b).

Figure 9 shows the runnable liabilities and annuities share and the commercial mortgage loss-to-capital ratio. Insurers with a large share of runnable nontraditional liabilities and annuities are more susceptible to runs if large losses materialize. Hence, insurers in the upper-right quadrant of the figure would have the largest run risks. Our analysis suggests few insurers with a large share of runnable liabilities could experience significant losses. For a small number of large insurers, the estimated losses exceed 5% of their adjusted capital. However, most of the large insurers with losses over 5% of capital—with the two exceptions—do not have outsized runnable liabilities and annuity shares. Similarly, the small insurer with the largest losses has little run risk.

10. Commercial mortgage-based securities (CMBS) prices and losses

A. CMBS price indexes by rating

B. Estimated mark-to-market losses



Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence and Bloomberg.

Next, we assess the indirect CRE exposure of insurers from their CMBS portfolios. We obtain current market prices for the CMBS holdings of insurers at the CUSIP level. Figure 10, panel A, shows the evolution of CMBS price indexes by rating. After falling sharply in March 2020, prices recovered after large interventions by the Federal Reserve, including direct support for the CMBS market through the Term Asset-Backed Securities Loan Facility (TALF). Prices started to decline in 2021, accelerated with the monetary tightening that started in 2022, and only recovered somewhat in early 2024. For each CUSIP, we obtain the average volume-weighted price in each quarter between 2022:Q4 and 2024:Q1 from TRACE and take the lowest average price.²³ We make this assumption to account for the possibility of runs, forcing insurers to sell these securities instead of holding the security to maturity. This assumption is conservative, increasing potential losses, while as we discuss in more detail later, not all insurers are equally susceptible to run risk.

Under this assumption, we find current mark-to-market losses of \$26.3 billion. These losses are significantly higher than those from insurers' direct exposure from commercial mortgages. The average mark-to-market loss for a AAA-rated tranche is 13.3%. For AA-, A-, and BBB-rated tranches the respective losses are 17.9%, 17.1%, and 22%. With the monetary tightening that began in the fall of 2022, prices of CMBS dropped. We therefore decompose the losses into an interest rate component and a credit risk component.²⁴ By comparing CMBS prices with same-maturity Treasury securities, we estimate that credit losses on AAA-rated are negligible: 1% for Conduit, but nearly 3% for SASB, in line with panel A of figure 10.²⁵ In total, credit losses account for 28% of mark-to-market losses in SASB CMBS compared to 17% for conduit CMBS. To be clear, the mark-to-market losses can be seen as an upper bound that would only materialize if insurers had to sell these securities. However, insurers typically hold these securities to maturity and likely will only have to absorb the credit losses.

Figure 10, panel B, plots the CMBS loss-to-capital ratio against the runnable liabilities and annuities. Five large insurers with assets over \$10 billion have mark-to-market losses of more than 20% of their adjusted capital, but these insurers have a share of runnable liabilities of under 25%.

11. Total losses and run risk



Sources: Authors' calculations and National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence and Global Commercial Real Estate Services.

In figure 11 we add the estimated losses from the commercial mortgage and CMBS portfolios, which amount to about \$36.3 billion. We find that under our price scenario, five large insurers experience losses of more than 20% of their adjusted capital, and four smaller insurers face losses of over 30% of capital.

We also evaluate the changes in the risk-based capital (RBC) ratio for the average large insurer, the RBC ratio (adjusted capital/(authorized control level RBC*2)) drops from 425% to 392%. Insurers with risk-based capital ratios under 400% may face heighted regulatory scrutiny.²⁶ One large insurer just crosses the threshold for regulatory action (200%) when adding the CRE losses.²⁷

Given current capital levels and when considered in isolation, the insurers' CRE related losses are unlikely to trigger runs on insurers, though some

large insurers may have to raise additional capital. Moreover, these losses could potentially lead to ratings downgrades of insurers, increasing their funding cost, further weakening their financial position, and increasing scrutiny by lenders and policyholders.²⁸

Market reaction to commercial real estate news

In this section, we analyze the response of life insurer stocks to news about commercial real estate. Specifically, we test whether stocks of life insurers with larger CRE exposure dropped more after the failure of Silicon Valley Bank in March 2023, when CRE concerns first made headlines, and after the CRE loan loss disclosures of New York Community Bancorp in January 2024.

Failure of Silicon Valley Bank

Concerns about CRE exposure featured prominently in the news after the failure of Silicon Valley Bank (SVB) on March 10, 2023. In the days following the SVB failure, academics, market participants, and the financial press speculated which other banks could be potentially susceptible to runs.²⁹ While SVB had only limited exposure to CRE, by mid-March 2023 CRE had become the focus as a potential source of significant losses for banks.³⁰ As a result, bank stocks, especially regional bank stocks, plummeted in March and April 2023. However, market commentary was mostly silent on the potential implications for life insurers despite their, in part significant, CRE exposures.

To test the market reaction to concerns about CRE that unfolded during March and April 2023, we assess whether differences in quarterly stock returns of life insurers in 2023 can be explained by differences in CRE exposure. We therefore estimate the following regression.

2) Stock Return_{i,t} = $\alpha_t + \beta$ Share $CRE_{i, 2022} + \gamma X_i + \epsilon_i$,

where *Share* $CRE_{i, 2022}$ is the CRE mortgage share of general account assets of insurer *i* in 2022:Q4, and X_i is a vector of insurer characteristics (log(assets) and surplus in 2022). We also include time-fixed effects (α_i) that control other economy-wide factors, such as the market return.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share CRE	-0.235	0.064						
	(0.259)	(0.214)						
High CRE			-0.021	0.014				
			(0.024)	(0.034)				
Share CRE and CMBS					-0.178	0.147		
					(0.299)	(0.189)		
Scenario losses							-0.001	0.020
							(0.115)	(0.114)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Time-fixed effects	Yes							
Observations	92	92	92	92	92	92	80	80
R^2	0.11	0.11	0.11	0.11	0.11	0.11	0.35	0.35

12. Estimated effect of commercial real estate (CRE) exposure on quarterly life insurers' stock returns

Notes: The figure shows the results of a panel regression estimating the effect of life insurers' CRE exposure on their quarterly stock returns in 2023. Share CRE is the CRE mortgage share of general account assets in 2022:Q4. High CRE is a dummy for the CRE mortgage share in the 75th percentile, Share CRE and CMBS is the CRE mortgage, and CMBS (actual cost) share is of general account assets as of 2022:Q4. Scenario losses are the estimated losses from direct (commercial mortgage portfolio) and indirect (CMBS) exposure to CRE relative to capital from the scenario analysis above. Controls are the log of general account assets and surplus as of 2022:Q4. Robust standard errors in parentheses.

Sources: Authors' calculations, National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence, and CRSP and Compustat data provided by Wharton Research Data Services.

Figure 12 shows the results of estimating equation 2. We do not detect a statistically or economically significant effect of exposure to CRE, either measured as the CRE mortgage share of general account assets (columns 1 and 2), as a dummy for the CRE mortgage share in the 75th percentile (columns 3 and 4), or as the CRE mortgage and CMBS share of general account assets (columns 5 and 6). Indeed, controlling for insurer size, measured as the log of general account assets, we find a positive, but insignificant coefficient on CRE exposure measures.³¹

CRE losses reported by New York Community Bancorp

CRE exposures of banks were again thrown into sharp relief following the earnings announcement of New York Community Bancorp (NYCB) on January 31, 2024.³² The bank reported \$185 million in write-offs, mostly attributable to two CRE loans, and a significant increase in provisioning for potential losses in the CRE loan portfolio. The announcement reignited questions about the health of banks.³³ We therefore test whether market participants were also concerned about life insurers' CRE exposure following the NYCB announcement. Different from the failure of SVB, in the NYCB case CRE was immediately the focus of market participants. Hence, we analyze the sensitivity of life insurers' stock returns to CRE exposure in an event study setting. Specifically, we estimate the following regression:

3) Stock Return_{*i*,*t*} =
$$\sum_{t=\text{Jan 15},2024}^{\text{Feb 15},2024} \beta_t$$
 Share $CRE_{i,2022} + \gamma_i + \alpha_t + \epsilon_i$,

where *Share* $CRE_{i, 2022}$ is again the CRE mortgage share of general account assets of insurer *i* in 2022:Q4, γ_i are insurer-fixed effects, and α_t are trading-day fixed effects that absorb general market conditions. The coefficient β_t captures the effect of CRE exposure on the stock return on day *t*.

13. Commercial real estate (CRE) exposure and life insurers' daily stock returns around New York Community Bancorp (NYCB) earnings announcement



Notes: The coefficients are the result of estimating equation 3. The sample period is from January 15, 2024, to February 15, 2024. Commercial real estate exposure is measured as CRE mortgage share of general account assets. The regression includes insurer and trading-day fixed effects. The standard error bands show robust standard errors.

Sources: Authors' calculations, National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence, and CRSP and Compustat data provided by Wharton Research Data Services. Figure 13 shows the results of estimating equation 3 in a 21-day window around January 31, 2024. We find no effect of CRE exposure on daily stock returns around the NYCB earnings announcement.

Taken together, we do not find evidence that exposure to CRE affected life insurers' stock returns in two periods of heightened concerns about CRE. One potential explanation is that life insurers' liabilities are less subject to runrisk than banks' uninsured deposits. As such, the evidence presented here is consistent with the interpretation that life insurers are asset insulators (Chodorow-Reich, Ghent, and Haddad, 2021).

Conclusion

We assess the potential losses from CRErelated investments in life insurers' portfolios. Using detailed location-property type price forecasts and CMBS prices, we estimate that the life insurance sector as a whole could face combined losses of about \$36.3 billion from direct and indirect exposures to CRE. We find that some individual large life insurers face significant losses of up to 34% of their capital.

However, the largest losses are concentrated in life insurers with limited run risk. We also document that stocks of publicly traded life insurers with large CRE exposure did not exhibit abnormal negative returns after the failure of SVB or the earnings announcement of NYCB, suggesting that market participants did not anticipate life insurers experiencing outsized losses related to CRE.

Notes

- ¹ Insurers' total assets are the sum of assets held on the "general account" and "separate account." General account assets support liabilities where the insurer bears the liability risk and investment risk, such as for term-life contracts or annuities with guarantees. In contrast, the separate account contains assets that back liabilities where the policyholder bears the risk, similar to a mutual fund. The largest asset class in the general account is corporate bonds, followed by CRE mortgages and private placements.
- ² While life insurers have a long history of investing in commercial real estate loans (Robinson, 1975), to the best of our knowledge no recent research has systematically assessed the CRE exposure of life insurers.
- ³ Insurers also have about \$30 billion in foreign commercial mortgages.
- ⁴ Given the stark differences between insurers' CRE mortgage underwriting and mortgages in CMBS, we do not follow the approach by Jiang et al. (2023a), which relies on CMBS prices to calculate commercial mortgage losses for banks.
- ⁵ In appendix 1, we assume that only loans with LTVs over 0.8 default, but that the loss on each of these loans is 30% of the mortgage balance, which on average leads to higher losses.

- ⁶ Nontraditional liabilities include, for example, funding-agreement-backed securities, borrowing from the Federal Home Loan Banks (FHLBs) backed by funding agreements, and repo and securities lending cash collateral. For more details on life insurers' nontraditional liabilities, see Foley-Fisher, Narajabad, and Verani (2019).
- ⁷ More information on the Financial Industry Regulatory Authority (FINRA) is available online.
- ⁸ For a comprehensive overview of the life insurance industry, see Koijen and Yogo (2023a).
- ⁹ There is also a more-dated literature on commercial loan defaults using life insurance data, see, e.g., Esaki, L'Heureux, and Snyderman (1999).
- ¹⁰ We construct the current LTV ratio with the most recent assessed price. Price assessments in 2022 already show some declines, increasing current LTV ratios.
- ¹¹ More information is available online.
- ¹² The distance between New York City and Chicago is about 700 miles and between New York City and Miami is about 1,000 miles.
- ¹³ In amortizing loans, the principal is repaid over time. Hence, amortizing loans become less risky over the lifetime of the loan as the outstanding balance shrinks. In contrast, loans with balloon payments require the borrower to pay back the loan amount at maturity.
- ¹⁴ There are two types of CMBS: conduit CMBS and single-asset, single-borrower (SASB) CMBS. Conduit CMBS are backed by a diverse mix of CRE loans. In contrast, SASB CMBS securitize either loans to multiple properties owned by a single borrower or by a single asset, slicing the cash flow generated by that asset.
- ¹⁵ We weight the price projection by the outstanding mortgage balances.
- ¹⁶ There could be additional discounts as foreclosure sales tend to yield lower prices increasing losses. However, some insurers may opt to add the property to their real estate portfolio, thereby reducing losses. As such, the losses estimated in this analysis should be interpreted with caution.
- ¹⁷ For hotels, we use the estimated retail price decline in the respective geography, for mixed-use buildings a weighted average of estimated retail, multifamily, and office price declines, and for all other properties the unweighted average of the estimated industrial, multifamily, office, and retail price declines. The weights for the mixed-use property price decline are 15% retail, 45% multifamily, and 40% office.
- ¹⁸ For the properties with assessments in 2021 or 2022 that already incorporate some price declines, we potentially overestimate losses.
- ¹⁹ For simplicity, we assume that all loans default and not only those that need to be refinanced. This assumption is backed by recent reports that borrowers defaulted well before maturity: For example, Wong (2024), Gittelsohn (2023), Buschbom et al. (2021), and Flynn Jr., Ghent, and Tchistyi (2020) present evidence of strategic renegotiation among CMBS borrowers. Glancy, Kurtzman, and Loewenstein (2022) present evidence consistent with bank borrowers strategically renegotiating at lower LTVs than CMBS borrowers.
- ²⁰ An alternative approach to estimating losses is to assume that loans with a loan-to-value (LTV) ratio of 80% default and in case of default, a specific percentage of the loan balance cannot be recovered. Specific triggers are common in CRE default models (see, e.g., BlackRock's CMBS defaults model). Glancy, Kurtzman, and Loewenstein (2022) show that an LTV of 80% is above the 99th percentile of at-origination CMBS LTV loans originated between 2012 and 2017. Using an 80% default threshold and a loss-given default of 30% yields larger losses to those reported in this section. See appendix 1.
- ²¹ In comparison to Manhattan and many other gateway cities, the office utilization rates for Los Angeles are higher, hence the estimated price declines are significantly smaller.
- ²² Runs in the insurance sector have occurred in the past, albeit in the context of more significant high-risk asset exposures. For instance, in 1991 Executive Life invested approximately 60% of its \$10.5 billion in the junk bond market. Policyholders aware of Executive Life's significant exposure to the junk bond market ran on the insurer. They requested policy withdrawals and surrenders of more than \$3 billion, roughly equal to 30% of the insurer's liabilities in that year, resulting in the insolvency of the insurer. In the 2008 global financial crisis, investors stopped rolling over funding-agreement-backed securities, a form of nontraditional liabilities (Foley-Fisher, Narajabad, and Verani, 2020).

- ²³ We start in 2021 to avoid the severe price dislocations early in the pandemic and the subsequent support for the CMBS market by TALF. For most prices, the lowest price was observed in 2023. For CUSIPs for which we do not observe a transaction, we use the average minimum price in the respective rating category.
- ²⁴ We chose to separate out interest rate-related losses, because life insurers largely hedge interest rate risk through duration matching of their liabilities, as well as by purchasing interest rate derivatives. As a result of this hedging activity, changes in the value of insurers' assets due to changes in interest rates are largely offset by corresponding changes in their liability values. However, in the event insurers sell assets, the realized gain/loss due to interest rate changes is booked in the interest maintenance reserve (IMR) and amortized over the duration of the sold security.
- ²⁵ For details, see appendix 2.
- ²⁶ The authorized control level RBC is the RBC at which surplus falls below 100% of the RBC amount.
- ²⁷ Since the risk-based capital ratio was only introduced in 1993, we cannot directly compare these changes to the failures during the 1990s.
- ²⁸ AM Best, the largest insurance rating agency, uses a methodology similar to the risk-based capital ratio as a crucial input in their rating process.
- ²⁹ See, e.g., Jiang et al. (2023b).
- ³⁰ See, e.g., Burgess (2023), Sample (2023), and Stein (2023).
- ³¹ Larger insurers have significantly larger CRE shares. Appendix 3 shows the results of an event study setting with monthly stock returns and insurer-fixed effects. The event study confirms that insurers with larger CRE exposure did not have more negative returns in the last three quarters of 2023.
- ³² See Heeb and Feuer (2024).
- ³³ See Armstrong and Wu (2024).

Appendix 1: Alternative loss assumptions for scenario analysis

In this robustness section, we modify the two key assumptions of the scenario analysis. First, we assume that instead of widespread strategic default, we assume that mortgages with an LTV of 0.8 or higher will default. Glancy, Kurtzman, and Loewenstein (2022) show that an LTV of 80% is above the 99th percentile of at-origination CMBS LTVs loans originated between 2012 and 2017. The second assumption is that the loss-given default is given by 30% of the mortgage balance. Given the low LTV, this assumption allows significant fire-sale discounts:

A1) $LGD = 0.3 \times Mortgage Balance if Stressed LTV \ge 0.8, 0$ otherwise.

Figure A1 shows the results of the scenario analysis with these assumptions. Estimated losses are larger, but only five large insurers would face losses on their mortgage portfolio in excess of 20% (left panel). Most insurers with large mortgage losses have a small share of runnable liabilities. Adding the losses on the CMBS portfolio, shown in the right panel of figure A1, results in losses of up to 50% of capital, but the two large insurers with the largest estimated losses have a runnable liabilities share of less than 20% mitigating concerns about runs. Two large insurers have estimated losses of over 20% of capital. In this scenario, several large insurers would face regulatory actions and would likely need to raise additional capital.



Source: Data from the National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence.

Appendix 2. Decomposition of commercial mortgage-backed securities (CMBS) losses

To decompose the mark-to-market losses in CMBS into an interest rate component and a credit risk component, we:

- 1. Find the ten-year Treasury rate at the time of the investment for each CMBS CUSIP,
- 2. Get the ten-year Treasury rate as of 2022:Q4,
- 3. Estimate the interest rate-only present value of each CMBS using the ten-year Treasury rate at the time of the investment as the coupon and the ten-year Treasury rate as the discount rate,
- 4. Calculate interest rate-only price as interest rate-only present value divided by the par value,
- 5. Estimate the price decline caused by increased credit risk as the difference between the interest rateonly price and the mark-to-market price, and
- 6. Estimate credit-related CMBS losses as the price decline caused by increased credit risk multiplied with the actual cost of the CMBS at the time of purchase.

These steps give us a back-of-the-envelope estimate of the mark-to-market losses from interest rate and credit risk increases. Figure A2 summarizes the results by CMBS type.

	Single-a	isset, single-k	orrower	Conduit			
	Holdings (billions of dollars)	Mark-to- Market loss (percent)	Credit loss (percent)	Holdings (billions of dollars)	Mark-to- Market loss (percent)	Credit loss (percent)	
AAA	30.3	13.2	2.7	102.4	13.3	0.9	
AA	3.8	17.6	4.8	8.8	17.9	4.6	
А	3.3	16.7	3.7	7.7	17.1	4.7	
BBB	2.9	24.3	9.0	7.7	22.0	8.8	
High yield	1.9	41.2	25.4	2.9	47.9	31.0	
Total (billions of dollars)	42.2	6.7	0.3	129.5	19.6	3.3	

Sources: Data on life insurers' CMBS holdings are from Schedule D of the National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence. Data on CMBS characteristics are from Trepp. Data on U.S. Treasury prices are from the Federal Reserve Bank of St. Louis, FRED database. Federal Reserve Economic Data. Data on CMBS prices are from the Financial Industry Regulatory Authority's Trade Reporting and Compliance Engine.

Appendix 3. Alternative event studies

Figure A3 shows an alternative approach to estimating the importance of insurers' CRE exposure for stock returns around the failure of SVB. We estimate an event study using monthly returns. Panel A shows the interactions between monthly dummy variables and the commercial mortgage-to-general account asset ratio. Panel B shows the interactions between monthly dummy variables and a dummy for an above-median commercial mortgage-to-general account asset ratio. We do not find that insurers with larger CRE exposure had lower returns after the failure of SVB.

A3. Monthly insurers' stock returns and commercial real estate exposure around Silicon Valley Bank (SVB) failure



Sources: Authors' calculations, National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence, and CRSP and Compustat data provided by Wharton Research Data Services.

A4. Daily insurers' stock returns and high commercial real estate exposure around New York Community Bancorp (NYCB) earnings announcement



Sources: Authors' calculations, National Association of Insurance Commissioners' statutory filings provided by S&P Global Market Intelligence, and CRSP and Compustat data provided by Wharton Research Data Services. Figure A4 shows an alternative approach to estimating the importance of insurers' CRE exposure for stock returns around the NYCB earnings announcement. We estimate an event study using daily returns. The figure shows the interactions between daily dummy variables and a dummy for an above median commercial mortgage-to-general account asset ratio. We do not find that insurers with larger CRE exposure had lower returns.

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