Too-Many-to-Ignore: Regional Banks and CRE Risks*

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Abstract

Over the past decade, regional banks have significantly increased their exposure to commercial real estate (CRE), and now hold over one-third of all U.S. commercial mortgage debt. The recent decline in commercial property values has raised concerns about the potential for distress in this segment to destabilize regional banks and generate broader financial spillovers. Despite these risks, the role of regional banks in the CRE market has received limited empirical attention. This paper documents the expansion of regional banks in CRE lending and provides new evidence on their exposure to latent distress, defined as high-risk loan positions that have not yet resulted in delinquency. We show that latent distress across banks substantially exceeds realized delinquency, and that regional banks, on average, are less exposed to such latent risk. This lower exposure is not the result of superior loan origination strategies, but rather reflects regional banks' concentration in geographic and sectoral markets that have been more resilient. Additionally, we find that well-capitalized regional banks face lower levels of latent distress once market and origination timing factors are controlled for. Finally, regional banks are more likely than large banks to accommodate borrowers through loan modifications, indicating a more flexible approach to managing distressed assets.

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1 Introduction

Across most loan markets, banks have conceded market shares to nonbank financial institutions following the financial crisis (Buchak, Matvos, Piskorski, and Seru, 2024). Yet, in the commercial mortgage market, banks have defied the rise of nonbank lenders. The share of commercial real estate (CRE) loans held by banks increased from 56% in 2014 to 62% in 2024.[1] However, this broad trend masks considerable heterogeneity across banks. While the 40 largest banks, which make up almost three-quarters of bank assets, have ceded market shares, the mortgage volume held by regional banks has tripled over the last decade. Today, every third U.S. commercial mortgage dollar has come from a regional bank.

Despite their striking expansion, regional bank activity in CRE markets has received only limited attention until recently. However, this changed as declines in commercial property valuations have sparked fears over regional banks' CRE exposures. For instance, the Federal Reserve Board (2023) notes in their financial stability report that "*a correction in office property valuations [...] could result in significant losses for a range of financial institutions with sizable exposures, including some regional and community banks.*" At the same time, lower capital requirements and more lenient supervision may severely limit the capacity of regional banks to withstand such large losses.

Still, the risks that arise from regional banks' substantial CRE loan books remain unclear as studies on regional banks have been scarce. Instead, research on CRE credit markets has so far mostly focused on large banks and on nonbank lenders, due to the detailed loan-level portfolio information that these institutions provide to regulators and investors. In contrast, the absence of similarly comprehensive data has hampered research on regional banks. To overcome this limited data availability, we turn to mortgage records collected from county offices across the United States. Public mortgage records are filed for any loan secured with real estate. This allows us to infer the commercial mortgage loan books of regional banks,

[1] In this paper, we focus on the nonfarm nonresidential and multi-family segments of the CRE market.

and systematically study their CRE lending behavior.

To start, we analyze how bank CRE lending has evolved over the expansion period from 2012 through 2019. The share of a bank's lending in a particular CRE market (geography by sector) is persistent over time, consistent with the notion that banks have expertise in particular local areas and CRE sectors. This persistence is not complete. Banks reduced the share in their existing markets to re-allocate funds towards new markets. We argue that these re-allocations do not just reflect changes in market-level demand but rather represent banks diversifying into new markets.

Furthermore, there exists notable variation in banks' CRE portfolio persistence by size. On average, persistence decreases with size. On one side, small and community banks seem to rely most on local knowledge as these banks are least likely to branch out to new markets. On the other side, lending by the largest banks seems to rely the least on market-specific knowledge as these banks' portfolios tilt most away from their prior exposures. One reason may be that the competitive advantage of these banks is less based on market-specific knowledge, and more on their cheaper deposit funding or their ability to shift funds around in response to changes in market demand.

When we zoom in on regional banks those most responsible for the expansion in commercial mortgages stand out. High-growth regional banks are significantly more likely to lend to new markets, and, in that dimension, their lending behavior resembles that of the large nationally active banks. In contrast, low-CRE growth regional banks display patterns similar to those of small banks with a higher share of lending maintained in their markets of existing expertise. Additionally, we find that small banks that rapidly grew their CRE loan books were more likely to enter new markets that are close to their headquarters. In contrast, this proximity effect is absent for regional banks.

Furthermore, the distribution of CRE risk exposure, measured as CRE loans relative to Tier 1 capital, has shifted left for large banks, indicating a decline in their exposure. In contrast,

regional banks have experienced the opposite trend, with a significant increase in the fraction of banks facing high CRE risk. In other words, the growth in CRE lending has outpaced the growth of their assets, leading to a higher concentration of CRE risk.

Next, we study the distribution of CRE risks in the banking sector. We ask how potential vulnerabilities relate to banks' expansion over the prior ten years. In regulatory filings, we observe that large banks display more significant signs of CRE risks materializing. Relative to regional and small banks, large banks report a higher proportion of their CRE loan book as delinquent. Furthermore, a larger share of their commercial mortgages required restructuring in response to borrower distress. Lastly, large banks' commercial mortgage charge-off rates are higher. It is possible that large banks are under more regulatory scrutiny, leading them to be more prudent when it comes to recognizing or provisioning for losses. It is also able that they are better able to afford such loss recognition or provisioning.

Furthermore, distress in CRE markets has historically been slow to materialize. Thus, the aforementioned indicators may conceal latent risks that will eventually lead to distress that emerges across all categories of banks. To better assess medium-term risks of bank CRE loan portfolios, we estimate loan-to-value (LTV) ratios at current commercial property valuations. This allows us to assess commercial mortgage health at the loan-level. Our estimates project LTVs at origination, which we observe from county mortgage and deed records, forward to today using granular market-level commercial property value changes from Real Capital Analytics. We classify loans at current LTV above 95% as distressed because lenders would experience a loss on their loan in case of foreclosure or failed refinancing.[2]

Our analysis reveals that latent CRE risk is significantly higher than the realized distress reflected in regulatory data. Specifically, unrealized distress is estimated to be between 2 to 5 times higher than current delinquency rates. While regional banks exhibit lower levels of latent risk, we do not observe clear distinctions in exposure between well-capitalized and

[2]We assume a 5% value loss to account for legal and procedural expenses and for discounts for properties that enter foreclosure.

under-capitalized regional banks.

We build on this measure of latent risk to first study the quantity of bank risk, we measure banks' distressed CRE loan volume in each market as a share of their total lending to that market. Our baseline finding is that large banks CRE loans have a larger share of loans in distress as result of being undercollateralized. In contrast, even though regional banks see slightly more distressed loans, they appear overall similar to small banks. One plausible explanation for this result is that large banks disproportionately lend in markets that have recently experienced property value losses. However, the inclusion of market fixed effects, reduces this baseline only slightly. Thus, large bank CRE stress cannot be fully explained through their their market-specific allocations. Instead, this result suggests that an important contributor to lower stress indicators for small and regional banks may be due to their more conservative lending and lower LTVs at origination.

Second, we study the distribution of risk within banks' portfolios. We measure a market's distressed loans relative to the banks' total distressed loans. Across banks, we find that high market share markets experience lower distress which is consistent with market specialization that allows banks to make better credit decisions. Here too, our findings indicate that small banks benefit more from their expertise as they experience relatively less distress in their key markets. These findings suggest that even though higher concentration leaves regional and small banks vulnerable to idiosyncratic fluctuations in commercial property prices, these banks effectively impose tighter lending standards to reduce loan portfolio risk. Ultimately, their tighter lending standard better insulate these banks from market-wide shocks.

Third, we investigate heterogeneity in distress within bank portfolios. For both total and relative portfolio distress, new markets that banks entered during the recent expansion period, and markets that are far from a banks' headquarters, are less likely to experience distress on average. This indicates that banks were more likely to expand into new and far-away markets that are less risky and lend at more prudent conditions. Interestingly, however, we observe

a differential increase in distress associated with new markets that are far away from banks' headquarter location. This effect is particularly pronounced for regional banks. In other words, regional banks that expanded to new markets that are far from their headquarters hold relatively more loans that ended up in distress.

Exploring the latent distress further, we document substantial heterogeneity in latent distress across banks, with large banks exhibiting significantly higher exposure than regional banks. Latent risk—defined by high loan-to-value ratios—is two to five times greater than realized delinquency, underscoring the extent of underlying financial vulnerability in the system. Regression estimates show that regional banks are less than half as exposed to latent distress compared to large banks, a difference primarily attributable to compositional factors. Specifically, geographic allocation accounts for roughly two-thirds of this differential, while sectoral exposure explains the remainder. This gap is not driven by the timing of loan originations but by the types of markets regional banks serve. Even when controlling for market and origination characteristics or weighting equally across banks, regional institutions consistently exhibit lower distress rates.

Further analysis reveals that capitalization plays a nuanced role. Among large banks, higher capitalization is associated with greater distress, consistent with potential "evergreening", although this relationship disappears when controlling for market factors and disappears when weighting by loan size. Within regional banks, capitalization effects emerge in the opposite direction and only when controlling for composition and equal-weighting institutions: well-capitalized regional banks display lower distress, particularly in multifamily lending.

Finally, we explore differences in property characteristics and loan profitability. Regional banks are modestly more likely to hold very old properties, but this tendency does not vary with capitalization. Additionally, they tend to lend to properties with slightly lower net effective rents—especially in the multifamily sector—though these differences are not strongly linked to capitalization levels.

Leveraging loan-level data, we analyze the differential behavior of regional banks in loan modifications when addressing distressed loans (LTV > 0.95). Our findings indicate that the distressed loan status is uncorrelated with the timing of refinancing. However, conditional on refinancing, distressed loans are more likely to require an increased equity contribution from the borrower. Interestingly, regional banks tend to require a lower equity contribution, suggesting a more lenient lending approach compared to other banks. Importantly, these effects remain robust even after controlling for sector-location-bank fixed effects, which account for unobservable time-varying factors that could otherwise bias our estimates

This paper is contemporaneous with other studies that aim to shed light on the status of the CRE market. Glancy and Kurtzman (2024) and Anenberg, Kim, and Moszkowski (2024) construct data sets based on public mortgage records. Both studies link bank CRE portfolios exposure to changes in work from home. Our study adds to the focus of these studies on already materialized delinquencies, by investigating the latent risks from undercollateralized loans yet to come due. Our focus relates to Crosignani and Prazad (2024) who show that less fragile banks extend maturities of their distressed borrowers to mitigate risks from loans coming due. That study utilizes the stress-test-based disclosures by the largest banks to establish their results. Our study complements their result through the focus on regional and small banks which account for most commercial mortgage holdings, today.

Lastly, we highlight a frequently overlooked aspect of CRE risk in the banking sector: the rapid expansion of regional banks in CRE credit markets over the last years which led to their current outsized exposures. We demonstrate that regional banks expanded by entering new markets, and a considerable portion of their existing risks can be traced to lending outside their prior areas of specialization. Our findings are critical to understand the causes of CRE-induced distress in the banking sector and their impact on financial stability.

2 Data

2.1 Data Sources

This section outlines the dataset utilized for the analysis presented in this paper.

Commercial Property Data. The use of detail commercial property transaction is key to our analysis. Commercial property data comes from Black Knight Financial Services ("Black Knight") which is a part of Intercontinental Exchange. Black Knight collects these data from public records at county-level offices. In total, their data cover almost 50 million records from more than 99% of U.S. counties.

In the U.S., a lender must make their interest public to be considered a secured party. For loans secured by real estate, this filing occurs at the county level. Important to our study, this record provides detailed loan-level information including the lender identity, the borrower identity, and the loan amount. In addition to this information, Black Knight collects data on the transfer or release of these liens, and on properties' pre-foreclosure notices. Jointly, this allows us to assign new commercial real estate loans to lenders and track lenders' commercial real estate loans over time.

Furthermore, Black Knight collects property-level data from county assessor's offices and ownership data from county deeds registries. The former assessment data includes for example a property's address, lot size, number of floors, assessed value and market value estimated by the assessor. The latter deeds data covers for each sale the buyer and the seller identity, the date at which the sale took place, and the sales price. All loan records can be matched to these data. Moreover, the assessment and deeds data cover the universe of commercial properties, including those properties that do not have a lien on them.

The use of public records data in this project provides a significant innovation to the literature. The majority of research on commercial real estate lending is based on data from (a)

reports by securitization conduits such as CMBS (e.g., Glancy, Kurtzman, and Loewenstein, 2022, who use Trepp data), (b) insurers' regulatory filings with the National Association of Insurance Commissioners (e.g., Glancy, Krainer, Kurtzman, and Nichols, 2022), or (c) capital assessment and stress testing reports made by the very largest banks via Form FR Y-14Q (e.g., Black, Krainer, and Nichols, 2020).There are a couple of notable exception to this is Ghent and Valkanov (2016) who use real estate transaction data on debt-financed transaction in Boston, Las Vegas, Los Angeles, and New York City. Also, Anenberg et al. (2024) and Glancy and Kurtzman (2024) use a similar deeds record data provided by Corelogic to examine the role of remote work trends and high loan-to-value ratios at origination on the distress in the CRE market. Research on other nonbank financial institutions and regional banks has been scarce due to limited data availability. This constitutes an important gap in this literature as these lenders jointly account for the majority of CRE loan holdings.

Bank Financial Data. Bank financial data comes from the Consolidated Reports of Condition and Income ("Call Reports") and from the Consolidated Financial Statements for Holding Companies ("Form Y-9C"). All commercial banks with offices in the U.S. are required to submit bank-level balance sheet, income statement, and supplemental information through Call Report Forms FFIEC 031, FFIEC 041, and FFIEC 051 at each quarter end. Similarly, all U.S. bank holding companies with consolidated assets above $3 billion must submit consolidated bank holding-level balance sheet, income statement, and supplemental information through Form FR Y-9C. As both Call Reports and Form FR Y-9C are standard data sources for financial research, we refrain from a more detailed discussion.

Commercial Property Price Indexes. We use Commercial Property Price Indices constructed by MSCI (formerly Real Capital Analytics). For each sector (office, retail, industrial, and apartments) and for sixty geographies, they compile a price per square foot (for O, R, and I sectors) and a price per apartment unit (for A) based on all real estate transactions over $2.5 million. We use their annual, hedonically-adjusted series. These data are described

in more detail in Koijen, Shah, and Van Nieuwerburgh (2024). We refer to a market as the combination of a sector and a geography. With 4 sectors and 60 geographies, we have 240 possible markets.[3]

2.2 Summary Statistics

In Table 1 we describe the characteristics of our loan level database. This table presents summary statistics for bank-level variables, distinguishing between all banks, those with high commercial real estate (CRE) growth, and those with low CRE growth. The sample includes data on total assets, CRE loans, and several key metrics related to market participation, portfolio allocation, and financial health as of 13Q1 and 19Q4.

For all banks, the mean total assets in 13Q1 were $7.23 billion, with significant variability (standard deviation of $81.82 billion) and a median of $0.32 billion, reflecting the presence of a few large banks alongside many smaller institutions. CRE loan balances grew by $0.50 billion on average over the period, with high CRE growth banks reporting a higher average increase of $0.75 billion compared to $0.35 billion for low-growth banks. High-growth banks also tended to expand into more new markets (mean of 9.90) compared to low-growth banks (mean of 4.26) and operated at a greater average distance from new markets (528.22 miles vs. 465.32 miles).

Portfolio composition reveals differences across bank groups. For example, high CRE growth banks allocated a greater proportion of their portfolios to office properties (18.35%) compared to low-growth banks (16.41%). In contrast, low-growth banks had a higher portfolio share in industrial and retail properties, with retail shares averaging 35.52% versus 34.49% for high-growth banks. Distressed CRE loan shares were fairly similar across groups, averaging around 44% for all banks but slightly higher for low-growth banks (44.87%) compared to high-growth banks (44.30%).

[3]Not all combinations exist in the data.

Financial health metrics show that high CRE growth banks had lower average Tier 1 Capital Ratios (13.70%) compared to low-growth banks (17.14%), indicating potentially greater financial leverage. Supplementary leverage ratios also differed slightly, averaging 10.9% for high-growth banks and 11.5% for low-growth banks.

Overall, the table highlights significant differences in growth strategies, portfolio allocations, and financial metrics between high and low CRE growth banks, with high-growth banks demonstrating more aggressive expansion strategies and portfolio concentration. These patterns provide important context for understanding the drivers of CRE growth and its implications for financial stability.

3 Empirical Strategy and Main Results

Regional bank exposure to commercial real estate may have aggregate implications for the financial stability of the banking sector and the economy in general. However, measuring this effect is complicated for at least two reasons: First, while many financial market participants have been subjected to increased transparency and data disclosure requirements, regional banks have largely resisted this trend. Consequently, there exists no readily available disaggregated information on regional bank lending activity that may allow researchers and policymakers to understand the scope and depth of the geographical exposure of regional banks to the CRE market. Second, identifying any effect from this exposure is hard as local economic factors that could affect the CRE loan market may simultaneously affect bank lending directly. Such factors would bias resulting estimates absent an empirical design that can isolate this effect.

3.1 Commercial Real Estate aggregate dynamics

We start our analysis by providing some stylized fact using regulatory call reports data. Figures 1 through 4 highlight aggregate trends in CRE lending, shedding light on the evolving

role of banks, particularly regional banks, in the market.

Figure 1 shows the total CRE mortgage amounts held by different investor types from 1946 to 2024. The data emphasize the persistent dominance of banks, in CRE lending, even as nonbank financial institutions have expanded their presence in other loan markets. Figure 2 breaks down the share of CRE mortgage holdings by investor type, underscoring the increasing reliance on banks for CRE financing.

Figure 3 focuses on the distribution of CRE mortgage holdings by bank size from 2008 to 2024. It reveals that large banks have reduced their share of CRE loans, while regional banks have significantly expanded their holdings. This shift reflects regional banks' active participation in CRE lending, particularly in markets underserved by large banks.

Figure 4 examines mortgage sizes, illustrating that smaller CRE loans (below $1 million) are more concentrated among regional and community banks. This focus on smaller loans aligns with the localized nature of regional banks' operations, emphasizing their role in supporting small and medium-sized enterprises. The data illustrate how regional banks have tailored their strategies to meet the needs of these borrowers, further driving their growth in CRE markets.

Regional banks' expansion is systematically different from that of large banks. Figure 5 shows the differential ratio of CRE growth as a fraction of total assets growth split between large and regional banks. The different slopes described in the scatter plot highlight the potential risks that regional banks face by expanding their loans at a much higher ratio than their larger counterparts.

Additionally, Figure 6 shows the distribution of banks by CRE exposure, defined as CRE lending over Tier 1 Capital, for large and regional banks between 2013 and 2023. It indicates that while the overall exposure of large banks contracted, the exposure of regional banks increased dramatically during this period.

3.2 Anatomy of CRE expansion from transaction level data

In order to explore and understand the expansion of CRE, we take advantage of the transaction-level data, allowing us to understand the way banks expanded not only on the aggregate but also to different sectors or geographical areas. Figure **??** illustrates this geographical diversification. Panel A shows the location of Bank OZK lending plotted as a share of lending. Bank OZK is headquartered in Arkansas but shows CRE lending in 2012 across the US. Fast forward to 2019, Panel B shows that new markets appear highlighted in the plot; notably, lending to Washington State, Coastal California, New York, and Florida represents a much larger fraction of their overall lending than in 2012.

We explore this dimension systematically by using the following specification:

$$\begin{aligned}\text{Portfolio Share}_{bm,19Q4} = \alpha_1 \cdot \text{Portfolio Share}_{bm,13Q1} \\ + \alpha_2 \cdot \text{Portfolio Share}_{bm,13Q1} \times \text{High CRE Growth}_b + \gamma_b + \delta_m + \varepsilon_{bm}\end{aligned} \tag{1}$$

Equation 1 models the share of bank b's total portfolio allocated to market m at the end of the expansion period in 2019 Q4, denoted as $\text{Portfolio Share}_{bm,19Q4}$. Here, market m is defined as the intersection of the geography associated with the property securing the loan and one of the four primary property-use sectors: office, retail, industrial, or multifamily. The term $\alpha_1 \cdot \text{Portfolio Share}_{bm,13Q1}$ captures the persistence of a bank's portfolio share, where $\text{Portfolio Share}_{bm,13Q1}$ represents the share of bank b's portfolio allocated to market m at the start of the study period in 2012 Q1. The interaction term, $\alpha_2 \cdot \text{Portfolio Share}_{bm,13Q1} \times \text{High CRE Growth}_b$, examines how the persistence of portfolio share varies for banks that experienced significant expansion during the 2012–2019 period. Here, High CRE Growth_b identifies banks in the top quartile of the distribution of CRE loan growth, scaled by total assets, over this period. The fixed effects, γ_b and δ_m, account for unobservable, bank-specific characteristics and market-specific factors, respectively. Finally, $\epsilon_{i,t}$ represents the error term, capturing idiosyncratic shocks to the portfolio share in market i. Standard errors are

clustered at the bank b level.

Table 2 provides detailed insights into the growth of CRE portfolios during the 2012q1-2019q4 expansion period. This analysis captures the heterogeneity in lending behavior across bank sizes and aligns with the introduction's focus on regional banks' central role in this growth.

The coefficient of the pre-existing portfolio share of a bank in a market in columns (5) and (6) highlights the strong persistence of regional banks in their lending activities, with values of 0.663 and .648, respectively. These coefficients are higher than those for large banks (0.507, column 3), indicating that regional banks maintain stronger ties to established markets while expanding their portfolios.

The interaction term with the banks that grew the most during this period in columns (5) and (6) is negative and statistically significant (-0.140 and -0.136, respectively), revealing that high-growth regional banks exhibit lower persistence in established markets. This suggests a strategic diversification into new markets.

In contrast, small banks show persistence similar to regional banks (0.649, column 7). However, their high-growth counterparts mimic the diversification strategies of regional banks, as indicated by the negative interaction coefficient (-0.062, column 7), but with a lower intensity.

These findings confirm the idea that regional banks' growth strategies during this period were systematically different, with a balance between persistence in existing markets and gradual diversification into new ones. The use of market (sector by geography) fixed effects alleviates the concerns that these results are not driven by market demand factors, emphasizing the deliberate strategic choices made by these banks.

In Table A1 to Table A3, we replicate the analysis in Equation 1 but within each sector: Office, Retail, Industrial and Multi-family. The analysis for regional banks in Table A2 show that the diversification to new markets is more pronounce for the office and multi-family

sector.

Table 3 aims to directly test the likelihood of banks entering a new market during the expansion period. The empirical specification is as follows:

$$\text{New Market}_{bm,19Q4} = \alpha_1 \text{High CRE Growth}_b + \delta_m + \varepsilon_{bm} \tag{2}$$

Equation 2 models the entry into a new market m by 2019 Q4 for bank b, specifically $\text{New Market}_{bm,19Q4}$ is an indicator equal to 1 if bank b did not have lending to market m in 2012Q1 and had lending greater than zero in market m in 2019Q4. Therefore, Equation 2 conditions the sample to markets that the banks did not have any exposure at the beginning of our sample. Here, High CRE Growth_b identifies banks in the top quartile of the distribution of CRE loan growth, scaled by total assets, over this period. The fixed effects, δ_m, account for unobservable market-specific factors. Finally, $\epsilon_{i,t}$ represents the error term, capturing idiosyncratic shocks to the portfolio share in market i. Standard errors are clustered at the bank b level.

Table 3 shows that on average, High CRE Growth banks were 1.8% more likely to enter a new market during the expansion period. However, there is substantial heterogeneity across bank types; for regional banks, this probability almost doubled, as they were 3.5% more likely to enter a new market than the low CRE growth regional banks. These results reinforce the interpretation of the findings in Table 2 regarding the expansion across markets implicit in the differentially smaller persistency and directly document the extent to which regional banks that grow their CRE lending are also entering new markets.

We investigate the dynamics of entering new markets further by introducing the distance between the new loan and the headquarters of the bank. The empirical specification is as follows:

$$\text{New Market}_{bm,19Q4} = \alpha_1 \text{Far(HQ)}_{mb} + \alpha_2 \text{Far(HQ)}_{mb} \times \text{High CRE Growth}_b + \gamma_b \delta_m + \varepsilon_{bm} \tag{3}$$

Where Far(HQ)_{mb} is an indicator equal to one if the distance of the loan in market m to the headquarters (HQ) of bank b is in the top quartile of the distance to HQ distribution. All other variables are defined in the same way as in equation 2.

Table 3 shows that, on average, large and regional high CRE growth banks did not differentially expand into new markets that were far from their main location. If anything, small banks that grew a lot in CRE were less likely to expand into new markets far away.

3.3 Distress of CRE after 2020

The post-2020 period revealed significant stress points within CRE portfolios, as illustrated in Figures **??** through **??**. These figures provide a comprehensive view of the distress experienced across bank categories in the aftermath of the COVID-19 pandemic and subsequent economic disruptions.

Figure **??** shows the share of CRE loans restructured due to borrower distress, with large banks exhibiting a higher proportion of restructurings compared to regional and smaller banks. Figure 7 and **??** reaffirm this finding using other metrics of distress.

Motivated by the differential expansion of banks based on their CRE growth during the 2012 to 2019 period we explore the role of that heterogeneity on distress. To analyze market dynamics, we construct our own measure of loan distress using transaction-level data. Distress is estimated via the current loan-to-value (LTV) ratio, which is calculated as follows. We start from the most recent transaction price in the deeds records for the property. We update that property value using the Commercial Property Price Index for that market (sector by geography) from MSCI. Finally, we assume that the last observed loan remains fully outstanding, i.e., that the loan is interest-only.[4] Loans with an LTV of 95% or higher

[4]Interest-only (IO) loans are the norm in CRE loan markets. Even if the loan is not IO, it has a maturity

are classified as distressed.

We employ two metrics to evaluate market distress. The first, *Distress Market/Total Loans*, represents the share of a bank's loans in distress within a specific market. The second metric, *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, highlighting risk concentration.

We explore this using the following specification:

$$\begin{aligned} \text{Distress}_{bm,23Q4} = \beta_1 \cdot \text{Portfolio Share}_{bm,19Q4} \\ + \beta_2 \cdot \text{Portfolio Share}_{bm,19Q4} \times \text{High CRE Growth}_b + \gamma_b + \delta_m + \varepsilon_{bm} \end{aligned} \tag{4}$$

Equation 4 models the level of distress for bank b in market m at the end of the period 2023 Q4, denoted as $\text{Distress}_{bm,23Q4}$. The term $\beta_1 \cdot \text{Portfolio Share}_{bm,19Q4}$ captures the influence of the bank's portfolio share in market m at the earlier point in 2019 Q4 on distress levels.[5] The interaction term, $\beta_2 \cdot \text{Portfolio Share}_{bm,19Q4} \times \text{High CRE Growth}_b$, reflects any differential distress associate to bank that grew their CRE exposure disproportionally during the 2012-2019 period, Here, High CRE Growth_b identifies banks in the top quartile of the distribution of CRE loan growth, scaled by total assets, over this period. The fixed effects, γ_b and δ_m, account for unobservable, bank-specific characteristics and market-specific factors, respectively. Finally, $\epsilon_{i,t}$ represents the error term, capturing idiosyncratic shocks to the portfolio share in market i. Standard errors are clustered at the bank b level.

Table 5, reports the results for equation 4 where the distress measure is defined as *Distress Market/Total Loans*, overall the β_1 coefficient is significantly lower for regional banks (0.352, column 5) than for large banks (0.483, column 3). A results that is consistent with large banks taking advantage of their scale to invest in riskier projects.

In table 6 we explore the allocation of risk across markets using the measure of distress define

that is much longer than its term so that the vast majority of the principal is still outstanding at term.

[5]The definition of $\text{Portfolio Share}_{bm,19Q4}$ follows the previous definition in equation 1

as *Distress Market/Total Distress* in this case β_1 coefficient for portfolio share for regional banks is 0.654 (column 5), indicating a higher concentration of risk in specific markets. Large banks, by contrast, show greater geographical and sectoral diversification, mitigating the impact of localized market stress.

These findings underscore the challenges regional banks face in managing CRE distress. While their portfolios are less inherently risky than those of large banks, their lack of diversification and concentrated exposure to specific markets make them more vulnerable to systemic shocks. This aligns with the introduction's emphasis on the potential financial instability posed by regional banks' CRE exposures. However, do not show strong evidence that the banks that growth a lot during the expansion period are disproportionally being affected by distress

We explore systematic differences in distress by bank type and sector in tables A4 to A6, we find that regional banks are, on average, more exposed to distress in the multifamily and office market (column 3 and 6, 0.436 and 0.388) than the large banks (coefficients of .263 and 0.332). Furthermore, the results on tables A7 to A9 also show that regional banks are more concentrated on their distress exposure. These two facts highlight the potential exposure of these banks to future defaults. Interestingly, there is no differential effect associated with high CRE growth banks in that dimension.

In tables 7 and 8, we explore the role of distance to lending and lending to new markets in shaping banks' exposure to distress. We find that, on average, new markets and distant markets are less associated with distress in the CRE market in 2023Q4, consistent with the view that, on average, banks expanded into markets where they had some knowledge. However, the interaction of new and distant markets yields a different conclusion: we find that, on average, banks that lend to far and new markets simultaneously are more likely to increase their exposure to distress. Interestingly, this effect is mostly driven by regional banks, highlighting the important role that these banks may play in the financial stability

of the banking sector related to CRE exposure.

3.4 Bank Latent Distress

We measure loan-to-value (LTV) ratios at origination using property transaction prices and mortgage records. Current property values are then estimated based on granular sector-location property price indices, providing a dynamic assessment of exposure. This metric enables individual banks to gauge their latent or unrealized risk in CRE lending.

3.4.1 Latent Distress by Bank Type

In Figure 8, we document that latent risk among banks is 2 to 5 times larger than realized delinquency rates, with larger banks exhibiting greater exposure to this risk. Interestingly, Figure 9 reveals no systematic differences in the magnitude of latent risk between well-capitalized and under-capitalized regional banks.

We formally document the differences between regional and large bank latent risk, specifically, we regress.

$$\text{Distress}_{lm(l)b(l)24Q3} = \beta Regional_b + \mu_{m(l)Orig} + \varepsilon_{lm(l)b(l)t}. \tag{5}$$

$\text{Distress}_{lm(l)b(l)24Q3}$ is an indicator that equals to 1 if loan l secured by a property in location-sector market m made by bank b has a current LTV larger than 95%. Regional_b is an indicator equal to 1 if bank b is a regional bank, and $\mu_{m(l)Orig}$ is a location-sector market m and Origination time fixed effect.

The analysis in Table 9 reveals that regional banks are significantly less exposed to distress compared to large banks, with their aggregate distress exposure amounting to less than half that of their larger banks (as indicated in column 2 of Table 9, where the ratio of coefficients is -0.05 to 0.098). This differential is not driven by the timing of loan origination, which appears to play no meaningful role in explaining the variation in distress outcomes. Rather,

the difference is largely compositional. Approximately one-third of the lower distress among regional banks can be attributed to differences in sectoral exposure, while the remaining two-thirds is explained by geographic allocation. Column 7 in Table 9 confirms that these patterns are fully accounted for by the types of markets—defined by sector and location—to which the banks are exposed, rather than by the timing of their loan originations. In other words, the relatively lower distress experienced by regional banks reflects their positioning in markets that proved more resilient, not a strategic advantage in loan timing.

This pattern persists even when alternative specifications that reflect differences across banks by equally waiting banks, not loans. Table 9 Panel C shows that regional banks continue to exhibit lower distress after controlling for observable compositional characteristics.

Sector-level analysis provides additional insights into the distribution of distress. Office properties account for the highest share of aggregate distress, approximately 20%, followed by multifamily properties. When controlling for sector exposure alone, the observed difference in distress between bank types diminishes, particularly for office properties. However, this effect disappears when both origination timing and geographic location are jointly controlled for. Notably, even after fully accounting for compositional factors, regional banks continue to experience slightly lower distress in the retail sector. This suggests that, within a given market, regional banks tend to originate loans on retail properties that are comparatively less distressed, indicating a degree of selection within market segments.

3.4.2 Bank Capitalization

We examine how distress varies with bank capitalization, beginning with the sample of large banks. Column 8 of Table 10 Panel A indicates that highly capitalized large banks are more likely to hold distressed loans—a pattern consistent with potential "evergreening" behavior. However, this association becomes weaker once unobserved market characteristics are controlled for in column 9 of Table 10. Moreover, the results suggest that the observed effect is primarily driven by smaller loan-originating institutions. When the analysis is

weighted by loan amounts, the capitalization-distress relationship dissipates, indicating that the effect is not present among larger loan exposures.

Table 10 Panel B, shows heterogeneity within regional banks, revealing important distinctions. While higher-capitalized regional banks do not exhibit significantly different distress levels in aggregate, a different picture emerges when analyzing loan performance by equal-weighting banks and controlling for compositional exposures. Under these conditions, banks with higher capitalization show significantly lower distress, particularly in the multifamily sector. This suggests that capitalization may influence loan performance through better asset selection within specific market-segment combinations.

3.4.3 Properties Characteristics

Additional analysis in Table 11 of property characteristics indicates that regional banks are approximately two percentage points more likely to hold very old properties, even after adjusting for compositional differences in their portfolios. However, this pattern does not extend to well-capitalized regional banks, which are neither more nor less likely to hold such properties relative to their peers.

Finally, an assessment of Net Effective Rent (NER) reveals that, within a given market, regional banks tend to lend to properties that are slightly less profitable, especially in the multifamily sector. However, these differences in property-level profitability do not appear to vary significantly by bank capitalization.

3.4.4 Bank Loan Modification

We investigate the extent to which banks refinance distressed CRE loans. We form a quarterly panel of loans in our sample and estimate the linear probability model,

$$\text{Refinanced}_{lm(l)b(l)t+1} = \beta \mathbb{1}\{\text{Loan Distress}_{lm(l)b(l)t} > 0\} + \mu_{b(l)m(l)t} + \varepsilon_{lm(l)b(l)t}. \tag{6}$$

Refinanced is an indicator that equals 100 if loan l secured by a property in location-sector market m made by bank b is refinanced in the next quarter $t+1$ and zero otherwise. Loan Distress measure the extent to which the loan's current loan-to-value ratio exceeds 95%. $\mathbb{1}\{\text{Loan Distress} > 0\}$ is an indicator that identifies distressed loans.

Our specification includes bank-location-sector-time fixed effects. Thus, our estimate captures a bank's propensity to refinance distressed properties relative to undistressed properties within the same location and sector in a given quarter. Consequently, our specification removes any bank-specific supply variation at the location-sector level. Standard errors are two-way clustered at the bank and location-sector levels.

Our results are tabulated in Table 12. Columns 1 and 2 show that we do not find an effect of loan distress on refinancing propensities in general. This holds for both specifications that include only time fixed effects in Column 1 and our full fixed effects specification in Column 2. Column 3 further estimates the difference in slopes between regional and large banks. Again, we do not find a discernible effect.

Overall, the results in Columns 1 through 3 are consistent with pre-determined refinancing behavior due to limited prepayment optionality. An effect may exist closer to maturity when loans are more commonly refinanced. To test this hypothesis, we restrict our sample from the full panel of loans in Columns 1 through 3 to near-maturity loans within one year before their maturity date. The results are presented in Columns 4 through 6. Again, we do not find a statistically significant effect at common levels of statistical significance in Columns 4 and 5. However, our negative estimates are close to significant at levels above the 11%-level. This indicates that banks may be more reluctant to provide funding for distressed loans. Interestingly, we do find a strong negatively significant effect when we distinguish between large and regional banks. While large banks are less willing to provide, our results suggest that regional banks may be more lenient in funding distressed borrowers.

Having analyzed bank lending propensity to their distressed borrowers, we next study behav-

ior conditional on providing new loans. Specifically, we ask whether banks require additional equity contributions from their distressed landlord borrowers. For the sample of refinancings, we estimate

$$\mathbb{1}\{\text{Equity Contribution}_{lm(l)b(l)t+1} > 0\} = \beta \mathbb{1}\{\text{Loan Distress}_{lm(l)b(l)t} > 0\} + \mu_{b(l)m(l)t} + \varepsilon_{lm(l)b(l)t}. \tag{7}$$

We measure equity contributions as the absolute relative change in the loan amount when less than the previous loan amount is refinanced. All other variables are defined as before. The sample consists of the set of refinanced loans.

Table 13 presents are our results. Columns 1 and 3 begin with our extensive margin results. While our previous findings, do now show a strong bank response on whether refinancing is provided, we find a strong reaction with respect to loan quantities. Landlords with distressed loans are 22% more likely to provide additional equity contributions when refinancing, which reduces the risk faced by the bank. Interestingly, when we distinguish between large and regional banks, we find that loans by regional banks are more than 30% less likely to benefit from additional equity contributions relative to large banks when refinanced.

Columns 4 and 5 show that landlords that are deeper in distress provide more additional equity when refinancing. However, Column 6 shows that we only find this relationship for large banks. For the regional banks, we do not find that more distress is associated with larger equity contributions.

Overall, the result in Table 13 suggests that regional banks are more lenient in providing refinancing terms to distressed borrowers.

4 Conclusion

We document the central role of regional banks in the expansion of commercial real estate (CRE) lending over the last decade and the implications for the distribution of CRE-induced distress in the banking sector. Using detailed loan-level data, we identify significant differences in growth strategies among banks. Expanding regional bank lending resembles that of large banks as regional banks decoupled from their local markets. In general, small and regional banks experience less distress despite their concentrated portfolios. We find that this result is not just driven by market selection. Rather, these banks benefit from lower borrower leverage. However, we find evidence that regional banks that expanded rapidly experience heightened distress due to their lending to new far-away markets. This suggests the presence of banking vulnerabilities as a result of the recent credit boom in CRE markets. Future research should investigate the wider economic implications of these vulnerabilities, including their impact on local credit availability and economic activity.

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Figure 1. CRE Mortgage Holding Amounts: 1946-2024

This figure shows mortgage holdings by investor type from March 31, 1946 to June 30, 2024. Holdings are displayed in trillion U.S. dollars.

Source: Federal Reserve Board Z.1.

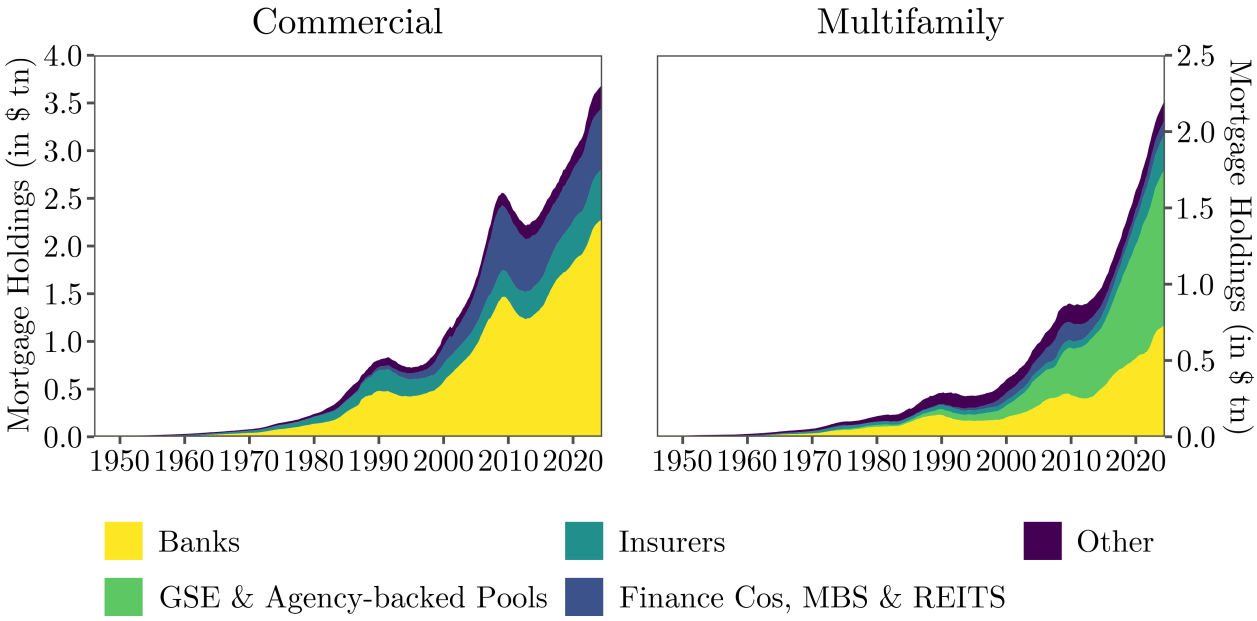

Figure 2. Share of CRE Mortgage Holdings: 1946-2024

This figure shows mortgage holdings by investor type from March 31, 1946 to June 30, 2024. Holdings are displayed as shares of total outstanding mortgages.

Source: Federal Reserve Board Z.1.

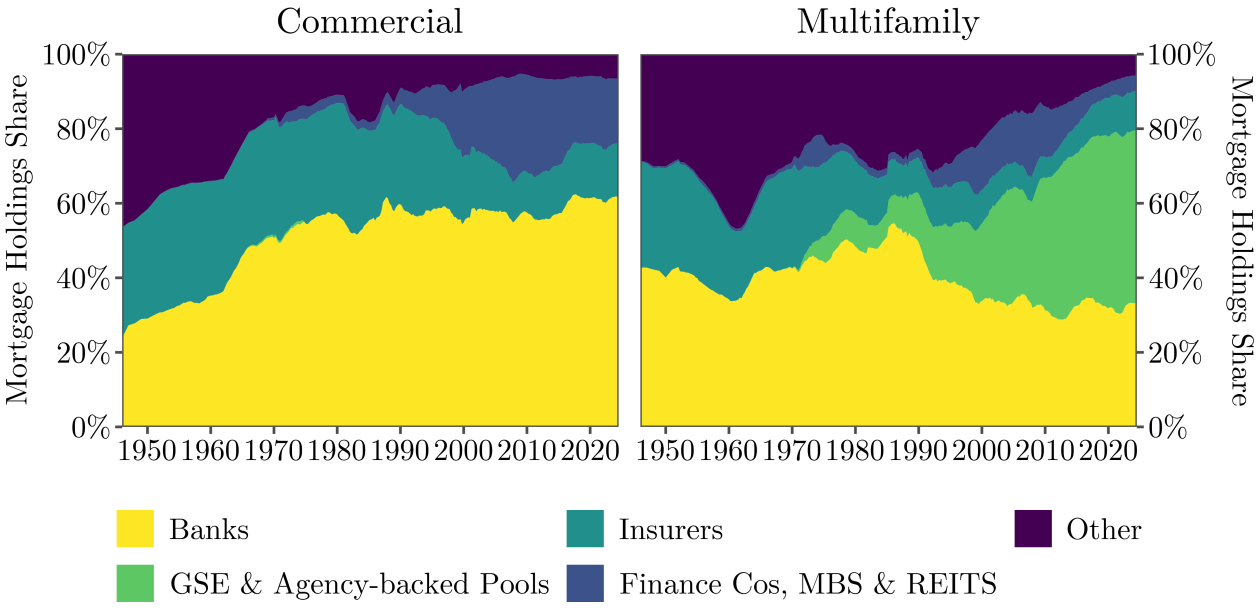

Figure 3. Aggregate Bank CRE Mortgage Holding Shares

This figure shows aggregate CRE mortgages holdings by bank size as share of the banking sectors' total CRE mortgage holdings from January 1, 2008 to June 30, 2024. Large banks are banks that at any time between January 1, 2008 and June 30, 2024 have at least $100bn in assets. Community banks are banks that throughout that window remain below the Community Reinvestment Act threshold of $1.564bn. All other banks are categorized as regional. Commercial and multifamily mortgage definitions follow those of the Federal Reserve Board Z.1.

Source: FFIEC 031/041/051, FR Y-9C.

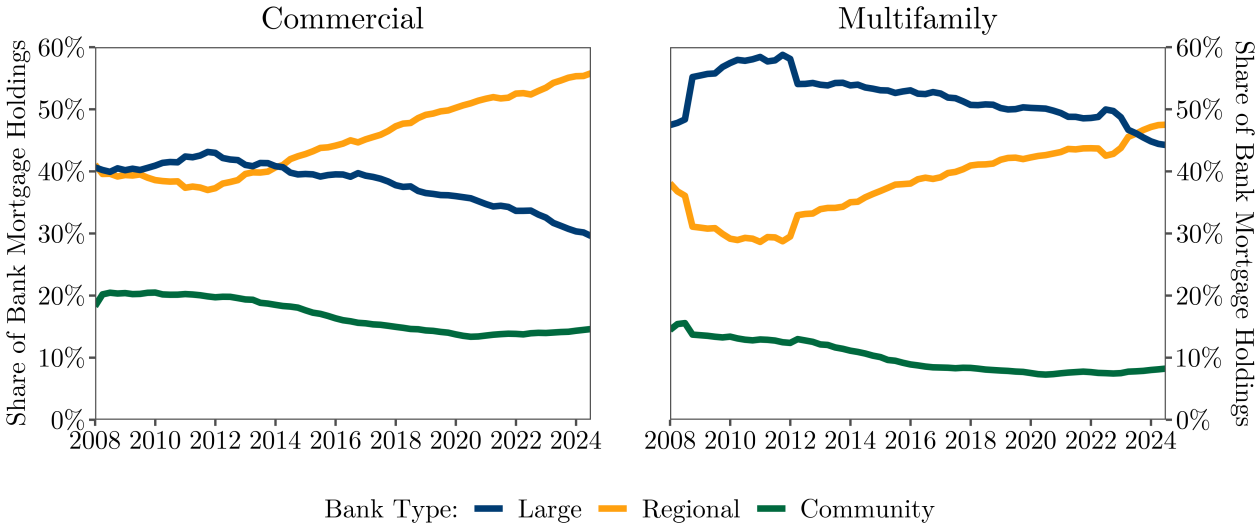

Figure 4. Commercial Mortgage Sizes

This figure shows the aggregate share of CRE mortgage holdings from mortgages that are up to $1m in size by bank size from January 1, 2011 to June 30, 2024. Large banks are banks that at any time between January 1, 2008 and June 30, 2024 have at least $100bn in assets. Community banks are banks that throughout that window remain below the Community Reinvestment Act threshold of $1.564bn. All other banks are categorized as regional. Commercial and multifamily mortgage definitions follow those of the Federal Reserve Board Z.1.

Source: FFIEC 031/041/051, FR Y-9C.

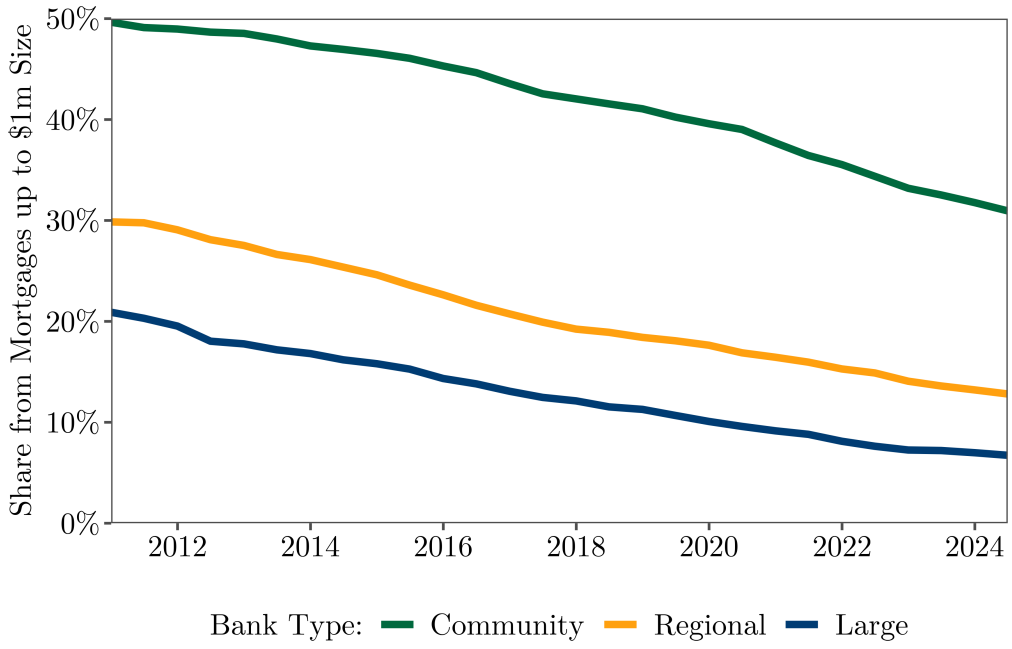

Figure 5. Commercial Real Estate Lending growth by Bank

This figure plots a scatter plot of the change in CRE mortgages between 2012 and 2019 with respect to the change in total assets in the same period. The scatter plot is divided between large and regional banks.
Source: FFIEC 031/041/051, FR Y-9C.

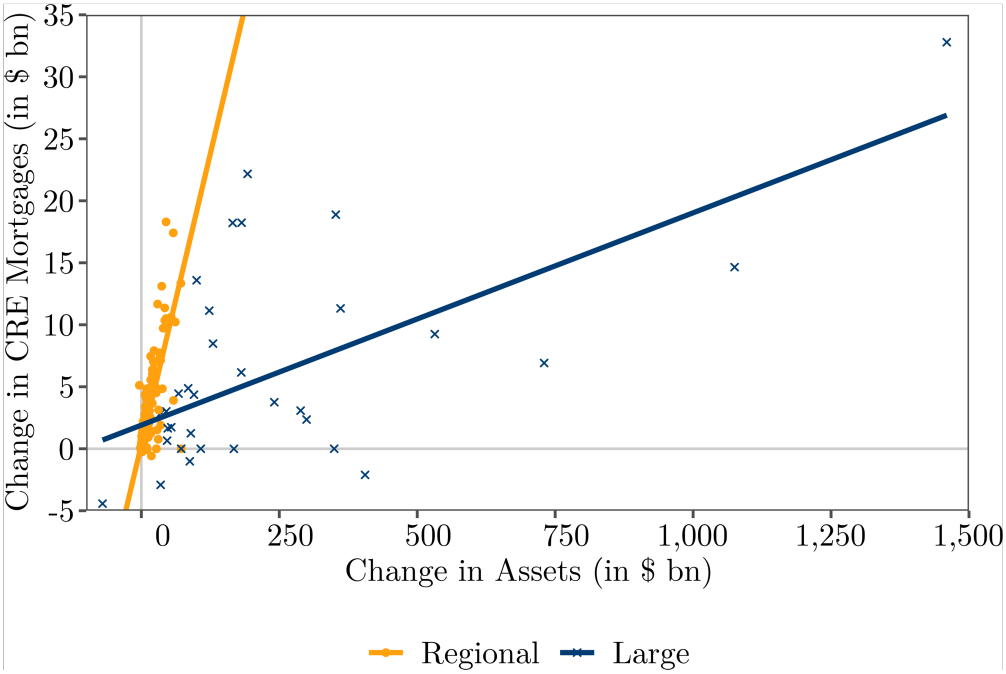

Figure 6. Regional and Large Bank CRE Exposure Over Last Decade

This figure plots the distribution of CRE Exposure defined as CRE Loans over Tier 1 Capital for Large and Regional Banks in 2013 and 2023.

Source: FFIEC 031/041/051, FR Y-9C.

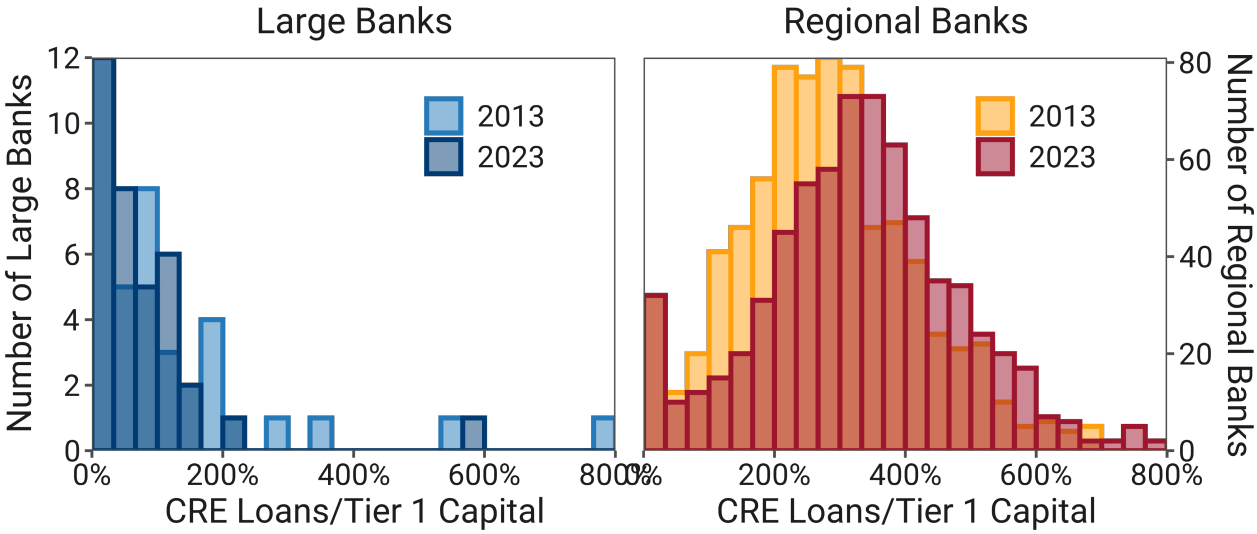

Figure 7. Aggregate Delinquent CRE Mortgages Long Run

This figure shows the aggregate share of CRE mortgages that are delinquent by bank size from January 1, 2008 to June 30, 2024. Large banks are banks that at any time between January 1, 2008 and June 30, 2024 have at least $100bn in assets. Community banks are banks that throughout that window remain below the Community Reinvestment Act threshold of $1.564bn. All other banks are categorized as regional. Commercial and multifamily mortgage definitions follow those of the Federal Reserve Board Z.1.
Source: FFIEC 031/041/051, FR Y-9C.

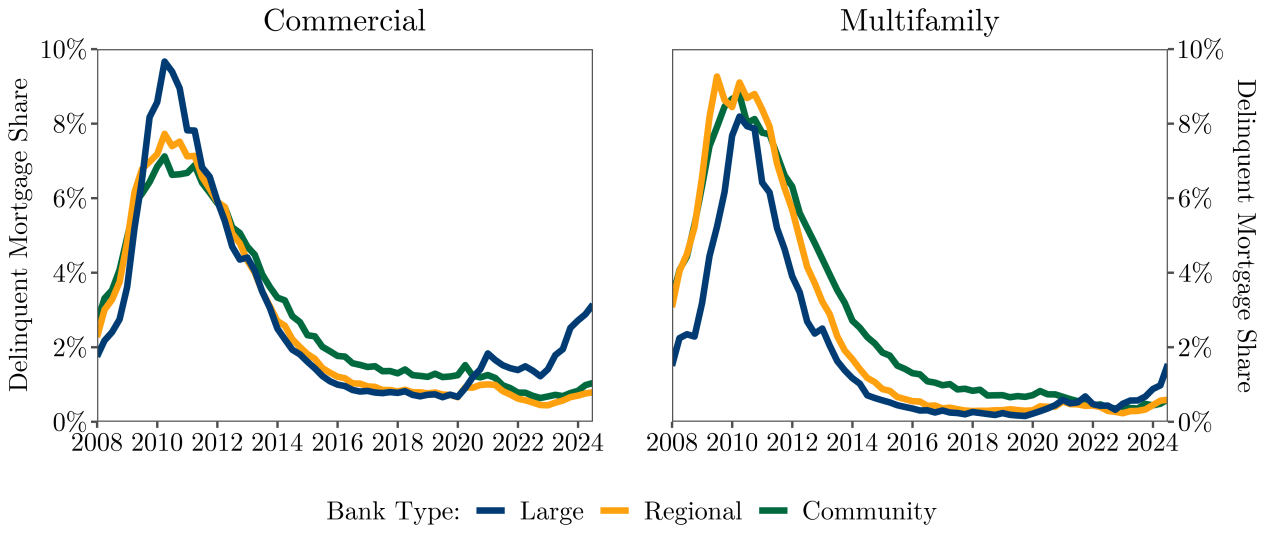

Figure 8. Aggregate Delinquent CRE Mortgages and Latent Risk

This figure shows the aggregate share of CRE mortgages that are delinquent by bank size from January 1, 2018 to June 30, 2024. Large banks are banks that at any time between January 1, 2018 and June 30, 2024 have at least $100bn in assets. Community banks are banks that throughout that window remain below the Community Reinvestment Act threshold of $1.564bn. All other banks are categorized as regional. Commercial and multifamily mortgage definitions follow those of the Federal Reserve Board Z.1. Latent risk is the fraction of loans outstanding with a current LTV > 1%

Source: FFIEC 031/041/051, FR Y-9C, Black Knight data and authors construction

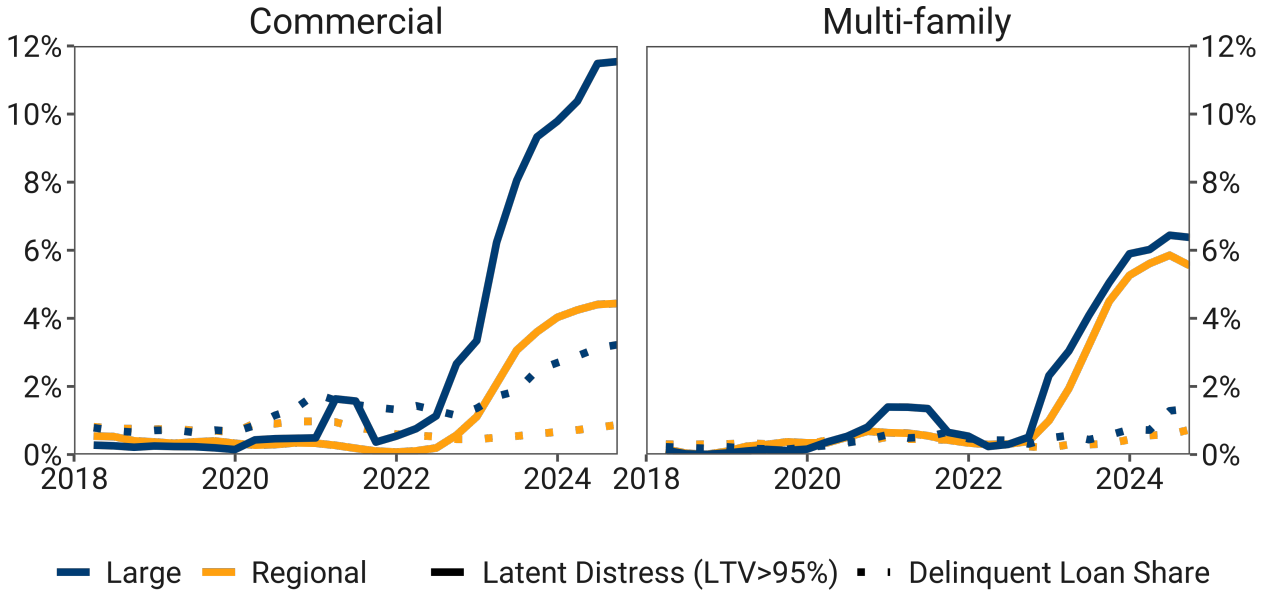

Figure 9. Aggregate Delinquent CRE Mortgages and Latent Risk for Regional Banks

This figure shows the aggregate share of CRE mortgages that are delinquent by bank size from January 1, 2018 to June 30, 2024 for our definition of Regional Banks. Well Capitalized and Undercapitalized are (...) Latent risk is the fraction of loans outstanding with a current LTV ¿ 1%

Source: FFIEC 031/041/051, FR Y-9C, Black Knight data and authors construction

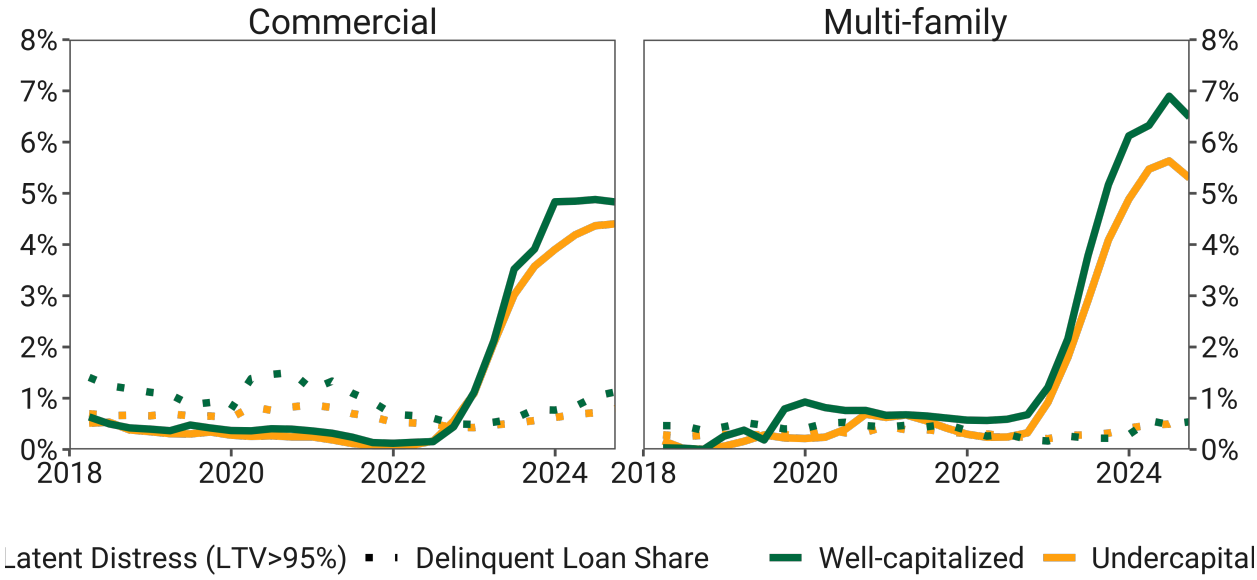

Table 1. Summary Statistics by Bank Type

This table shows summary statistics for all banks and banks split into large, regional, and small banks. *Total Assets 13Q1* is total assets at the start of the first quarter of 2013, measured in billions of U.S. dollars. *Chg. Total Assets 13Q1-19Q4* is the change in total assets between the first quarter of 2013 and the fourth quarter of 2019, measured in billions of U.S. dollars. *Total CRE Loans 13Q1* indicates the total commercial real estate (CRE) loans as of the first quarter of 2013, also measured in billions of U.S. dollars. *Chg. Total CRE Loans 13Q1-19Q4* captures the change in total CRE loans over the same period. *Number of Markets* is the count of distinct markets in which a bank operates. *Number of Geographies* reflects the number of geographies covered by a bank. *Number of Sectors* refers to the count of distinct CRE sectors. *Number of New Markets* denotes the count of new markets entered by a bank during the observed time period. *Avg. Distance to New Markets* measures the average geographical distance, in miles, from a bank's head quarter to its newly entered markets. *Portfolio Share 13Q1: Office*, *Retail*, *Industrial*, and *Multi-family* measure the proportion of a bank's CRE loan portfolio allocated to the sectors office, retail, industrial, and multi-family, respectively, as of the first quarter of 2013. *Distressed CRE Loan Share* represents the percentage share of total CRE loans classified as distressed. *Supplementary Leverage Ratio 19Q4* measures Tier 1 capital as a percentage of total leverage exposure as of the fourth quarter of 2019. *Tier 1 Capital Ratio 19Q4* is the ratio of Tier 1 capital to risk-weighted assets as of the fourth quarter of 2019.

Table 1. Summary Statistics by Bank Type (continued)

		All			High CRE Growth			Low CRE Growth		
Variable	Unit	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
Panel A: All Banks										
Total Assets 13Q1	$ bn	7.23	81.82	0.32	1.32	2.89	0.47	10.67	102.76	0.28
Chg. Total Assets 13Q1-19Q4	$ bn	2.86	20.90	0.16	1.72	3.52	0.45	3.52	26.14	0.08
Total CRE Loans 13Q1	$ bn	0.64	4.35	0.07	0.40	1.25	0.12	0.77	5.39	0.05
Chg. Total CRE Loans 13Q1-19Q4	$ bn	0.50	2.28	0.05	0.75	1.44	0.24	0.35	2.64	0.02
Number of Markets		9.54	19.50	5.00	9.69	10.67	6.00	9.45	23.14	4.00
Number of RCA Areas		4.10	7.18	2.00	4.34	4.87	3.00	3.97	8.23	2.00
Number of Sectors		3.30	1.02	4.00	3.57	0.81	4.00	3.14	1.09	4.00
Number of New Markets		6.34	11.37	2.00	9.90	13.41	5.00	4.26	9.39	2.00
Avg. Distance to New Markets	mi	491.21	400.75	397.58	528.22	371.02	470.19	465.32	418.61	358.15
Portfolio Share 13Q1: Office	%	17.12	18.95	13.05	18.35	16.99	15.17	16.41	19.97	11.51
Portfolio Share 13Q1: Retail	%	35.14	25.82	32.69	34.49	22.02	33.39	35.52	27.80	31.93
Portfolio Share 13Q1: Industrial	%	25.67	23.92	20.67	24.71	19.37	22.29	26.23	26.20	18.86
Portfolio Share 13Q1: Multi-family	%	22.07	25.83	13.72	22.45	23.41	15.46	21.84	27.16	12.40
Distressed CRE Loan Share	%	44.20	27.03	44.53	44.30	22.41	44.44	44.15	29.40	44.87
Supplementary Leverage Ratio 19Q4	%	11.29	3.44	10.47	10.90	2.28	10.42	11.52	3.95	10.52
Tier 1 Capital Ratio 19Q4	%	15.88	6.56	14.04	13.70	3.10	12.96	17.14	7.63	14.99

Table 1. Summary Statistics by Bank Type (continued)

		All			High CRE Growth			Low CRE Growth		
Variable	Unit	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
Panel B: Large Banks										
Total Assets 13Q1	$ bn	327.92	514.53	113.81	31.93	15.74	31.93	349.84	527.12	124.71
Chg. Total Assets 13Q1-19Q4	$ bn	102.59	115.96	58.16	14.77	5.96	14.77	109.09	117.66	58.54
Total CRE Loans 13Q1	$ bn	19.67	25.23	11.79	16.44	13.07	16.44	19.91	26.04	11.79
Chg. Total CRE Loans 13Q1-19Q4	$ bn	8.66	13.05	5.47	9.79	4.22	9.79	8.58	13.52	5.16
Number of Markets		106.79	67.07	97.00	74.50	45.96	74.50	109.19	68.39	97.00
Number of RCA Areas		38.79	15.57	40.00	30.00	11.31	30.00	39.44	15.80	42.00
Number of Sectors		3.93	0.26	4.00	4.00	0.00	4.00	3.93	0.27	4.00
Number of New Markets		35.38	25.76	31.00	42.00	19.80	42.00	34.89	26.38	31.00
Avg. Distance to New Markets	mi	1,052.74	358.21	1,018.27	977.12	26.98	977.12	1,058.56	371.56	1,047.30
Portfolio Share 13Q1: Office	%	16.61	9.96	16.58	24.95	15.34	24.95	15.99	9.59	16.58
Portfolio Share 13Q1: Retail	%	33.05	21.63	29.77	18.17	16.11	18.17	34.15	21.81	30.10
Portfolio Share 13Q1: Industrial	%	27.38	13.50	27.89	14.59	14.86	14.59	28.33	13.21	29.28
Portfolio Share 13Q1: Multi-family	%	22.97	20.55	16.41	42.29	46.32	42.29	21.54	18.48	16.41
Distressed CRE Loan Share	%	63.86	19.07	67.01	45.54	5.06	45.54	65.21	19.05	69.38
Supplementary Leverage Ratio 19Q4	%	9.80	1.70	9.77	9.48	0.15	9.48	9.83	1.76	9.80
Tier 1 Capital Ratio 19Q4	%	13.07	2.50	12.30	11.98	0.62	11.98	13.15	2.58	12.30

Table 1. Summary Statistics by Bank Type (continued)

		All			High CRE Growth			Low CRE Growth		
Variable	Unit	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
Panel C: Regional Banks										
Total Assets 13Q1	$ bn	3.05	5.70	1.21	2.07	2.69	1.09	4.53	8.21	1.47
Chg. Total Assets 13Q1-19Q4	$ bn	2.75	4.55	1.01	2.97	4.32	1.26	2.40	4.86	0.70
Total CRE Loans 13Q1	$ bn	0.72	1.36	0.34	0.59	0.77	0.32	0.92	1.93	0.37
Chg. Total CRE Loans 13Q1-19Q4	$ bn	0.97	1.47	0.41	1.26	1.64	0.62	0.52	1.01	0.20
Number of Markets		14.33	16.86	9.00	13.15	11.80	9.00	16.12	22.37	8.00
Number of RCA Areas		6.45	7.44	4.00	5.91	5.51	4.00	7.27	9.62	4.00
Number of Sectors		3.73	0.70	4.00	3.75	0.67	4.00	3.71	0.74	4.00
Number of New Markets		12.70	14.76	7.00	14.96	16.04	9.00	9.28	11.81	4.00
Avg. Distance to New Markets	mi	617.06	468.70	569.99	605.58	389.76	572.64	635.09	571.77	568.17
Portfolio Share 13Q1: Office	%	18.40	14.27	16.75	18.64	14.75	16.90	18.04	13.53	16.44
Portfolio Share 13Q1: Retail	%	33.31	18.19	33.19	32.90	18.28	33.18	33.95	18.07	33.56
Portfolio Share 13Q1: Industrial	%	25.56	18.23	22.80	24.02	15.92	22.56	27.89	21.10	23.82
Portfolio Share 13Q1: Multi-family	%	22.73	22.76	15.35	24.44	23.94	16.39	20.12	20.63	14.46
Distressed CRE Loan Share	%	47.64	20.88	47.91	46.99	19.55	47.02	48.63	22.77	48.75
Supplementary Leverage Ratio 19Q4	%	10.87	2.74	10.28	10.80	2.16	10.39	10.97	3.45	10.08
Tier 1 Capital Ratio 19Q4	%	14.15	5.24	12.87	13.37	2.87	12.72	15.34	7.38	13.23

Table 1. Summary Statistics by Bank Type (continued)

		All			High CRE Growth			Low CRE Growth		
Variable	Unit	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
Panel D: Small Banks										
Total Assets 13Q1	$ bn	0.26	0.19	0.20	0.24	0.17	0.18	0.26	0.20	0.21
Chg. Total Assets 13Q1-19Q4	$ bn	0.11	0.13	0.07	0.20	0.15	0.16	0.08	0.11	0.05
Total CRE Loans 13Q1	$ bn	0.06	0.06	0.04	0.07	0.07	0.05	0.06	0.06	0.04
Chg. Total CRE Loans 13Q1-19Q4	$ bn	0.04	0.06	0.02	0.11	0.08	0.09	0.02	0.03	0.01
Number of Markets		4.45	3.49	4.00	5.28	3.74	4.00	4.15	3.35	4.00
Number of RCA Areas		1.97	1.86	1.00	2.37	2.10	2.00	1.83	1.74	1.00
Number of Sectors		3.07	1.09	3.00	3.38	0.91	4.00	2.96	1.13	3.00
Number of New Markets		2.40	3.49	1.00	3.93	4.50	3.00	1.85	2.87	1.00
Avg. Distance to New Markets	mi	392.28	306.86	337.36	426.11	318.54	351.85	377.79	300.86	334.78
Portfolio Share 13Q1: Office	%	16.51	21.02	10.31	17.97	19.27	13.01	15.99	21.60	8.61
Portfolio Share 13Q1: Retail	%	36.10	28.90	32.13	36.42	25.52	34.81	35.98	30.02	31.14
Portfolio Share 13Q1: Industrial	%	25.68	26.48	17.99	25.57	22.68	22.12	25.71	27.71	16.24
Portfolio Share 13Q1: Multi-family	%	21.71	27.35	10.95	20.04	22.45	13.27	22.31	28.88	9.72
Distressed CRE Loan Share	%	41.96	29.41	41.30	41.24	25.03	40.53	42.21	30.82	41.88
Supplementary Leverage Ratio 19Q4	%	11.54	3.74	10.64	11.02	2.42	10.43	11.72	4.10	10.78
Tier 1 Capital Ratio 19Q4	%	16.80	7.02	14.85	14.10	3.31	13.42	17.76	7.70	15.66

Table 2. Portfolio Share 12Q1 to 19Q4.

This table examines the persistence of banks' portfolios by markets. Each market is defined as the combination of a geographical area and one of the property sectors: Office, Retail, Industrial, or Multi-family. $PortfolioShare_{YYQQ}$ is the portfolio share in market m in year YY and quarter QQ. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more details see equation 1. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Portfolio Share_{19Q4}							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\text{Portfolio Share}_{12Q1}$	0.596***	0.569***	0.496***	0.398***	0.617***	0.602***	0.665***	0.644***
	(21.808)	(20.599)	(6.456)	(5.313)	(24.598)	(23.685)	(33.878)	(32.300)
$\text{Portfolio Share}_{12Q1}$ × High CRE Growth	-0.020	-0.005	0.079	0.151	-0.110**	-0.106**	-0.053*	-0.047
	(-0.578)	(-0.147)	(0.565)	(1.123)	(-2.460)	(-2.423)	(-1.702)	(-1.524)
Bank Sample	All	All	Large	Large	Regional	Regional	Small	Small
Property Type Sample	All	All	All	All	All	All	All	All
Number of Banks	1,811	1,811	29	29	518	518	1,264	1,264
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	–	Yes	–	Yes	–	Yes	–	Yes
Observations	434,640	434,640	6,960	6,960	124,320	124,320	303,360	303,360
R^2	0.462	0.473	0.367	0.428	0.481	0.490	0.486	0.494

Table 3. New Market.

This table examines the likelihood of *High CRE Growth* banks to enter into new markets during the 2012 to 2019 period. Each market is defined as the combination of a geographical area and one of the property types: Office, Retail, Industrial, or Multi-family. *New Market* is a dummy equal to 1 if a market m was not in a bank portfolio in 2012Q2 but was there in 2019Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more details, see equation 2. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	New Market			
	(1)	(2)	(3)	(4)
High CRE Growth	0.018***	-0.022	0.035***	0.007***
	(4.938)	(-0.342)	(4.050)	(5.814)
Bank Sample	All	Large	Regional	Small
Property Type Sample	All	All	All	All
Number of Banks	1,396	28	489	879
Sector-RCA Area FE	Yes	Yes	Yes	Yes
Observations	321,367	3,863	110,285	207,219
R^2	0.024	0.177	0.031	0.035

Table 4. New Market and HQ Distance.

This table examines the likelihood of *High CRE Growth* banks to enter into new markets during the 2012 to 2019 period and the interaction with how distant are those markets with respect to the banks's headquarter. Each market is defined as the combination of a geographical area and one of the property sectors: Office, Retail, Industrial, or Multi-family. *Far(HQ)* is a dummy equal to 1 if a market m is in the highest quartile of the distance distribution of bank-markets pairs. *New Market* is a dummy equal to 1 if a market m was not in a bank portfolio in 2012Q2 but was there in 2019Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more details, see equation 3. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	New Market							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Far (HQ)	-0.077***	-0.124***	-0.024	-0.104**	-0.150***	-0.186***	-0.051***	-0.061***
	(-2.644)	(-4.444)	(-0.550)	(-2.423)	(-7.784)	(-9.050)	(-6.510)	(-7.075)
Far (HQ) × High CRE Growth	-0.089**	-0.084**	-0.148	-0.122	-0.037	-0.042	-0.037***	-0.033***
	(-2.424)	(-2.438)	(-1.514)	(-1.167)	(-0.854)	(-1.022)	(-3.764)	(-3.411)
Bank Sample	All	All	Large	Large	Regional	Regional	Small	Small
Property Type Sample	All	All	All	All	All	All	All	All
Number of Banks	1,396	1,396	28	28	489	489	879	879
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	–	Yes	–	Yes	–	Yes	–	Yes
Observations	320,901	320,901	3,862	3,862	109,820	109,820	207,219	207,219
R^2	0.167	0.238	0.097	0.288	0.118	0.191	0.062	0.105

Table 5. Distress Market-to-Total Loans - Portfolio Share.

This table examines how the distress exposure of banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area and one of the property sectors: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Loans*, represents the share of a bank's loans in distress within a specific market, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Loans							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Portfolio $Share_{19Q4}$	0.312***	0.304***	0.507***	0.473***	0.351***	0.341***	0.311***	0.294***
	(10.654)	(10.841)	(6.820)	(5.842)	(10.289)	(11.014)	(8.004)	(7.261)
Portfolio $Share_{19Q4}$ × High CRE Growth	0.040	0.040	-0.186**	-0.161*	-0.036	-0.034	-0.008	-0.009
	(1.088)	(1.143)	(-2.354)	(-1.895)	(-0.805)	(-0.835)	(-0.159)	(-0.176)
Bank Sample	All	All	Large	Large	Regional	Regional	Small	Small
Property Type Sample	All	All	All	All	All	All	All	All
Number of Banks	1,932	1,932	31	31	568	568	1,333	1,333
Bank-Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	–	Yes	–	Yes	–	Yes	–	Yes
Observations	21,031	21,029	3,317	3,310	11,766	11,765	5,948	5,943
R^2	0.549	0.563	0.434	0.484	0.535	0.565	0.468	0.509

Table 6. Distress Market-to-Total Distress - Portfolio Share.

This table examines how the distress exposure of banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area and one of the property sectors: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Distressed Loans							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Portfolio $Share_{19Q4}$	0.597***	0.574***	0.645***	0.600***	0.616***	0.589***	0.586***	0.536***
	(12.462)	(12.006)	(4.706)	(4.043)	(9.571)	(9.543)	(10.799)	(9.735)
Portfolio $Share_{19Q4}$ × High CRE Growth	0.035	0.048	0.045	0.069	0.001	0.035	0.048	0.055
	(0.469)	(0.676)	(0.302)	(0.418)	(0.012)	(0.394)	(0.548)	(0.666)
Bank Sample	All	All	Large	Large	Regional	Regional	Small	Small
Property Type Sample	All	All	All	All	All	All	All	All
Number of Banks	1,932	1,932	31	31	568	568	1,333	1,333
Bank-Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	–	Yes	–	Yes	–	Yes	–	Yes
Observations	20,731	20,729	3,307	3,300	11,709	11,708	5,715	5,709
R^2	0.429	0.449	0.315	0.364	0.377	0.429	0.308	0.370

Table 7. Distress Market-to-Total Loans - New Markets and HQ Distance.

This table examines how the distress exposure of banks' entry into new markets and the distance of those markets. Each market is defined as the combination of a geographical area and one of the property sectors: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Loans*, represents the share of a bank's loans in distress within a specific market, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. *Far(HQ)* is a dummy equal to 1 if a market m is in the highest quartile of the distance distribution of bank-markets pairs. *New Market* is a dummy equal to 1 if a market m was not in a bank portfolio in 2012Q2 but was there in 2019Q4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Loans							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New Market	-0.023***	-0.019***	-0.005*	-0.003	-0.028***	-0.024***	-0.039***	-0.034***
	(-12.117)	(-11.064)	(-1.862)	(-1.343)	(-14.404)	(-12.616)	(-7.222)	(-6.318)
Far (HQ)	-0.009***	-0.012***	-0.002**	-0.003**	-0.016***	-0.021***	-0.031*	-0.043***
	(-4.994)	(-6.150)	(-2.387)	(-2.729)	(-7.418)	(-9.483)	(-1.883)	(-3.182)
New Market × Far (HQ)	0.009***	0.009***	0.002	0.001	0.016***	0.016***	0.006	0.011
	(4.692)	(4.430)	(0.796)	(0.574)	(6.326)	(6.997)	(0.437)	(0.815)
Bank Sample	All	All	Large	Large	Regional	Regional	Small	Small
Property Type Sample	All	All	All	All	All	All	All	All
Number of Banks	1,932	1,932	31	31	568	568	1,333	1,333
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	–	Yes	–	Yes	–	Yes	–	Yes
Observations	19,441	19,439	3,224	3,217	11,067	11,066	5,150	5,145
R^2	0.361	0.394	0.064	0.215	0.314	0.369	0.314	0.402

Table 8. Distress Market-to-Total Distressed Loans - New Markets and HQ Distance.

This table examines how the distress exposure of banks' entry into new markets and the distance of those markets. Each market is defined as the combination of a geographical area and one of the property sectors: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. *Far(HQ)* is a dummy equal to 1 if a market m is in the highest quartile of the distance distribution of bank-markets pairs. *New Market* is a dummy equal to 1 if a market m was not in a bank portfolio in 2012Q2 but was there in 2019Q4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Distressed Loans							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New Market	-0.040***	-0.035***	-0.007	-0.004	-0.050***	-0.045***	-0.071***	-0.060***
	(-10.853)	(-9.876)	(-1.567)	(-1.045)	(-12.741)	(-11.368)	(-5.132)	(-4.218)
Far (HQ)	-0.016***	-0.021***	-0.003**	-0.003*	-0.031***	-0.041***	-0.032	-0.058*
	(-4.427)	(-4.984)	(-2.066)	(-1.867)	(-5.614)	(-7.582)	(-0.987)	(-1.901)
New Market × Far (HQ)	0.019***	0.016***	0.003	0.001	0.032***	0.034***	-0.027	-0.025
	(4.279)	(3.710)	(0.828)	(0.386)	(5.522)	(6.196)	(-0.709)	(-0.724)
Bank Sample	All	All	Large	Large	Regional	Regional	Small	Small
Property Type Sample	All	All	All	All	All	All	All	All
Number of Banks	1,932	1,932	31	31	568	568	1,333	1,333
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	–	Yes	–	Yes	–	Yes	–	Yes
Observations	19,206	19,204	3,214	3,207	11,015	11,014	4,977	4,971
R^2	0.305	0.334	0.057	0.170	0.236	0.293	0.190	0.299

Table 9. Distress Loan Level by Bank Type

This table examines how the distress exposure at the loan level by bank type. Standard errors are clustered at the bank level and reported in parentheses below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively

	$\mathbb{1}\{\text{Distressed}_{24Q3}\}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	0.073***	0.098***					
	(10.279)	(8.496)					
Regional		-0.052***	-0.054***	-0.035***	-0.021*	-0.005	-0.003
		(-4.328)	(-4.809)	(-3.598)	(-1.844)	(-0.759)	(-0.712)
Orig. Quarter FE	–	–	Yes	–	–	–	–
Sector FE	–	–	–	Yes	–	–	–
Location FE	–	–	–	–	Yes	–	–
Sector-Location FE	–	–	–	–	–	Yes	–
Orig. Quarter-Sector-Location FE	–	–	–	–	–	–	Yes
Observations	140,244	140,244	140,244	140,244	140,244	140,244	138,239
R^2		0.010	0.040	0.090	0.165	0.300	0.571

Table 9. Distress Loan Level by Bank Type (continued)

	$\mathbb{1}\{\text{Distressed}_{24Q3}\}$				
	(1)	(2)	(3)	(4)	(5)
Industrial	0.008***				
	(5.806)				
Multi-family	0.060***				
	(9.230)				
Office	0.213***				
	(8.024)				
Retail	0.015***				
	(7.151)				
Regional × Industrial		0.001	-0.002	0.000	-0.003
		(0.168)	(-0.487)	(0.040)	(-0.889)
Regional × Multi-family		-0.013	-0.014	-0.004	0.005
		(-1.158)	(-1.335)	(-0.528)	(0.722)
Regional × Office		-0.136***	-0.126***	-0.013	-0.016*
		(-3.422)	(-4.147)	(-0.548)	(-1.714)
Regional × Retail		-0.004	-0.009*	-0.004	-0.009***
		(-0.823)	(-1.834)	(-0.853)	(-3.032)
Sector FE	–	Yes	–	–	–
Sector-Orig. Quarter FE	–	–	Yes	–	–
Sector-Location FE	–	–	–	Yes	–
Sector-Orig. Quarter-Location FE	–	–	–	–	Yes
Observations	140,244	140,244	140,235	140,244	138,239
R^2	0.086	0.100	0.176	0.300	0.571

Table 9. Distress Loan Level by Bank Type (continued)

	$\mathbb{1}\{\text{Distressed}_{24Q3}\}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.035***				0.033***			
	(19.470)				(19.010)			
Regional		-0.004				-0.007**		
		(-1.156)				(-2.310)		
Industrial			0.005***				0.004***	
			(6.055)				(6.219)	
Multi-family			0.031***				0.031***	
			(9.377)				(10.167)	
Office			0.097***				0.095***	
			(17.832)				(14.809)	
Retail			0.012***				0.014***	
			(13.930)				(10.175)	
Regional × Industrial				-0.002				-0.001
				(-1.446)				(-0.797)
Regional × Multi-family				-0.001				-0.013**
				(-0.099)				(-2.052)
Regional × Office				-0.011**				-0.004
				(-2.252)				(-0.559)
Regional × Retail				-0.004***				-0.003
				(-2.699)				(-1.239)
Orig. Quarter-Sector-Location FE	–	Yes	–	–	–	Yes	–	–
Sector-Orig. Quarter-Location FE	–	–	–	Yes	–	–	–	Yes
Weighting	Unweighted	Unweighted	Unweighted	Unweighted	Bank	Bank	Bank	Bank
Observations	140,244	138,239	140,244	138,239	140,244	138,239	140,244	138,239
R^2		0.312	0.032	0.312		0.354	0.033	0.354

Table 10. Distress Loan Level by Bank Capitalization.

This table examines how the distress exposure at the loan level by bank type and tier 1 capital ratios. Standard errors are clustered at the bank level and reported in parentheses below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	$\mathbb{1}\{\text{Distressed}_{24Q3}\}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.098***	0.000		0.037***	0.048***		0.040***	0.010	
	(8.345)	(0.005)		(10.975)	(3.099)		(9.895)	(0.678)	
Tier 1 Ratio_{21Q4}		0.696	0.182		-0.078	-0.131*		0.223**	0.111
		(0.997)	(0.774)		(-0.726)	(-1.758)		(2.239)	(0.978)
Orig. Quarter-Sector-Location FE	–	–	Yes	–	–	Yes	–	–	Yes
Weighting	Dollar	Dollar	Dollar	Unweighted	Unweighted	Unweighted	Bank	Bank	Bank
Bank Sample	Large	Large	Large	Large	Large	Large	Large	Large	Large
Observations	65,479	65,479	63,159	65,479	65,479	63,159	65,479	65,479	63,159
R^2		0.004	0.709		0.000	0.361		0.002	0.459

	$\mathbb{1}\{\text{Distressed}_{24Q3}\}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.046***	0.063***		0.033***	0.047***		0.032***	0.038***	
	(15.440)	(4.746)		(17.403)	(5.666)		(16.971)	(8.043)	
Tier 1 Ratio_{21Q4}		-0.129	-0.190**		-0.106*	-0.137***		-0.039	-0.144***
		(-1.272)	(-2.111)		(-1.756)	(-3.079)		(-1.231)	(-2.736)
Orig. Quarter-Sector-Location FE	–	–	Yes	–	–	Yes	–	–	Yes
Weighting	Dollar	Dollar	Dollar	Unweighted	Unweighted	Unweighted	Bank	Bank	Bank
Bank Sample	Regional	Regional	Regional	Regional	Regional	Regional	Regional	Regional	Regional
Observations	74,765	74,765	72,875	74,765	74,765	72,875	74,765	74,765	72,875
R^2		0.000	0.423		0.000	0.324		0.000	0.361

Table 11. Property Characteristics.

This table examines differential characteristics of properties by bank type. Standard errors are clustered at the bank-level and reported in parentheses below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Very Old								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.055***	0.045***		0.094***	0.087***		0.097***	0.080***	
	(21.445)	(16.413)		(33.059)	(22.619)		(37.757)	(17.765)	
Regional		0.021***	0.017***		0.013***	0.015***		0.020***	0.015***
		(5.831)	(5.061)		(2.925)	(3.578)		(3.694)	(3.025)
Orig. Quarter-Sector-Location FE	–	–	Yes	–	–	Yes	–	–	Yes
Weighting	Dollar	Dollar	Dollar	Unweighted	Unweighted	Unweighted	Bank	Bank	Bank
Observations	126,257	126,257	124,226	126,257	126,257	124,226	126,257	126,257	124,226
R^2		0.002	0.148		0.001	0.068		0.000	0.132

	$\ln \text{NER}_{21Q4}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	5.554***	5.621***		6.192***	6.482***		5.816***	6.230***	
	(11.098)	(7.530)		(12.059)	(9.112)		(22.869)	(14.271)	
Regional		-0.186	-0.034*		-0.791	-0.017		-0.576	0.012
		(-0.222)	(-1.804)		(-1.000)	(-0.971)		(-1.080)	(0.710)
Orig. Quarter-Sector-Location FE	–	–	Yes	–	–	Yes	–	–	Yes
Weighting	Dollar	Dollar	Dollar	Unweighted	Unweighted	Unweighted	Bank	Bank	Bank
Observations	31,646	31,646	29,845	31,646	31,646	29,845	31,646	31,646	29,845
R^2		0.001	0.984		0.014	0.983		0.006	0.985

Table 12. Mortgage Distress and Refinancing.

This table examines how refinancing responds to loan distress. The sample consists of CRE loans outstanding in a given quarter from March 2018 through June 2024. *Refinanced* equals 100 if a loan is refinanced in a given quarter and zero otherwise. Loan Distress is the larger of zero and the difference between a loan's current loan-to-value ratio. Standard errors are two-way clustered at the bank-level and the market (location-sector)-level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Refinanced					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{\text{Distress} > 0\}$	-0.068	-0.002	-0.059	-0.487	-0.449	-0.922**
	(-0.935)	(-0.039)	(-0.471)	(-1.469)	(-1.578)	(-2.161)
$\mathbb{1}\{\text{Distress} > 0\} \times$ Regional			0.104			0.806
			(0.625)			(1.455)
Sample	All	All	All	Near Maturity	Near Maturity	Near Maturity
Quarter FE	Yes	–	–	Yes	–	–
Bank-Location-Sector-Quarter FE	–	Yes	Yes	–	Yes	Yes
Observations	4,209,418	4,209,418	4,209,418	555,794	555,794	555,794
R^2	0.003	0.087	0.087	0.002	0.252	0.252

Table 13. Mortgage Distress and Additional Equity Contributions.

This table examines additional equity contributions provided by borrowers in loan refinancings. responds to loan distress. The sample consists of CRE loans refinanced between March 2018 through June 2024. *Equity Contribution* measures the absolute relative change in the loan amount when less than the outstanding loan is refinanced. Loan Distress is the larger of zero and the difference between a loan's current loan-to-value ratio. Standard errors are two-way clustered at the bank-level and the market (location-sector)-level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	$\mathbb{1}\{\text{Equity Contribution} > 0\}$			Equity Contribution		
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{\text{Distress} > 0\}$	0.231***	0.220***	0.257***			
	(6.460)	(4.244)	(6.554)			
$\mathbb{1}\{\text{Distress} > 0\} \times$ Regional			-0.082*			
			(-1.743)			
Distress				1.598***	1.183*	2.123***
				(3.296)	(1.705)	(7.811)
Distress × Regional						-2.552***
						(-4.258)
Quarter FE	Yes	–	–	Yes	–	–
Bank-Location-Sector-Quarter FE	–	Yes	Yes	–	Yes	Yes
Observations	80,800	80,800	80,800	80,800	80,800	80,800
R^2	0.003	0.568	0.568	0.005	0.594	0.595

Appendix

A Appendix Tables

A.1 Portfolio Share 12Q1 to 19Q4 by Sector and Bank Type

Table A1. Large Banks: Portfolio Share 12Q1 to 19Q4 by Sector.

This table examines the persistence of large banks' portfolios by markets within each sector: Office, Retail, Industrial and Multi-Family. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. $PortfolioShare_{YYQQ}$ is the portfolio share in market m in year YY and quarter QQ. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more details see equation 1. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Portfolio Share$_{19Q4}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{12Q1}$	0.398***	0.423***	0.324***	0.415***	0.332***	0.512***
	(5.313)	(5.461)	(6.831)	(4.909)	(2.984)	(5.269)
Portfolio Share$_{12Q1}$ × High CRE Growth	0.151	0.131	0.104	0.005	-0.012	0.162
	(1.123)	(0.915)	(0.477)	(0.026)	(-0.070)	(1.403)
Bank Sample	Large	Large	Large	Large	Large	Large
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	29	29	29	28	28	28
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	6,960	6,960	1,740	1,680	1,680	1,680
R^2	0.428	0.403	0.424	0.511	0.389	0.539

Table A2. Regional Banks: Portfolio Share 12Q1 to 19Q4 by Sector.

This table examines the persistence of regional banks' portfolios by markets within each sector: Office, Retail, Industrial and Multi-Family. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. $PortfolioShare_{YYQQ}$ is the portfolio share in market m in year YY and quarter QQ. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more details see equation 1. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Portfolio Share$_{19Q4}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{12Q1}$	0.602***	0.604***	0.710***	0.712***	0.708***	0.687***
	(23.685)	(23.809)	(27.973)	(25.328)	(24.251)	(25.699)
Portfolio Share$_{12Q1}$ × High CRE Growth	-0.106**	-0.106**	-0.202***	-0.094**	-0.044	-0.143***
	(-2.423)	(-2.396)	(-3.058)	(-2.017)	(-0.995)	(-2.933)
Bank Sample	Regional	Regional	Regional	Regional	Regional	Regional
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	518	518	468	487	477	480
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	124,320	124,320	28,080	29,220	28,620	28,800
R^2	0.490	0.487	0.611	0.658	0.674	0.587

Table A3. Small Banks: Portfolio Share 12Q1 to 19Q4 by Sector.

This table examines the persistence of small banks' portfolios by markets within each sector: Office, Retail, Industrial and Multi-Family. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. $PortfolioShare_{YYQQ}$ is the portfolio share in market m in year YY and quarter QQ. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more details see equation 1. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Portfolio Share_{19Q4}					
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Portfolio Share}_{12Q1}$	0.644***	0.648***	0.830***	0.843***	0.871***	0.857***
	(32.300)	(32.510)	(30.222)	(48.032)	(51.227)	(38.264)
$\text{Portfolio Share}_{12Q1}$ × High CRE Growth	-0.047	-0.049	-0.033	-0.056**	-0.045*	-0.033
	(-1.524)	(-1.577)	(-0.945)	(-2.218)	(-1.828)	(-0.966)
Bank Sample	Small	Small	Small	Small	Small	Small
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	1,264	1,264	779	948	891	765
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-RCA Area FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	303,360	303,360	46,740	56,880	53,460	45,900
R^2	0.494	0.492	0.753	0.785	0.811	0.783

A.2 Distress Market-to-Total/Distressed Loans - Portfolio Share by Sector and Bank Type

Table A4. Large Banks: Distress Market-to-Total Loans - Portfolio Share by Sector.

This table examines how the distress exposure of large banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{19Q4}$	0.443***	0.451***	0.263***	0.606***	0.480***	0.332***
	(6.284)	(6.519)	(3.324)	(4.410)	(6.062)	(3.703)
Portfolio Share$_{19Q4}$ × High CRE Growth	-0.133*	-0.137*	-0.191	-0.284**	-0.342***	0.040
	(-1.809)	(-1.985)	(-1.675)	(-2.166)	(-2.936)	(0.409)
Bank Sample	Large	Large	Large	Large	Large	Large
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	31	31	30	30	30	31
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	3,310	3,316	771	872	866	797
R^2	0.479	0.450	0.331	0.533	0.492	0.571

Table A5. Regional Banks: Distress Market-to-Total Loans - Portfolio Share by Sector.

This table examines how the distress exposure of regional banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{19Q4}$	0.307***	0.308***	0.436***	0.420***	0.319***	0.388***
	(7.169)	(6.763)	(13.300)	(18.812)	(11.540)	(14.280)
Portfolio Share$_{19Q4}$ × High CRE Growth	0.048	0.054	-0.073	-0.059	-0.046	-0.061
	(0.978)	(1.030)	(-1.461)	(-1.644)	(-1.148)	(-1.592)
Bank Sample	Regional	Regional	Regional	Regional	Regional	Regional
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	568	568	521	543	525	520
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	11,765	11,765	2,316	3,721	3,031	2,359
R^2	0.566	0.543	0.688	0.690	0.618	0.672

Table A6. Small Banks: Distress Market-to-Total Loans - Portfolio Share by Sector.

This table examines how the distress exposure of small banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{19Q4}$	0.286***	0.304***	0.178***	0.351***	0.178***	0.215***
	(7.833)	(8.790)	(3.420)	(9.036)	(5.860)	(5.037)
Portfolio Share$_{19Q4}$ × High CRE Growth	0.009	0.010	0.116	-0.003	0.027	-0.006
	(0.170)	(0.196)	(1.623)	(-0.055)	(0.675)	(-0.091)
Bank Sample	Small	Small	Small	Small	Small	Small
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	1,333	1,333	861	1,072	954	893
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	5,943	5,947	751	1,433	923	694
R^2	0.509	0.476	0.596	0.647	0.623	0.638

Table A7. Large Banks: Distress Market-to-Total Distressed Loans - Portfolio Share by Sector.

This table examines how the distress exposure of large banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Distressed Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{19Q4}$	0.586***	0.600***	0.357***	0.496***	0.505***	0.543***
	(4.703)	(4.724)	(3.069)	(5.402)	(4.525)	(3.947)
Portfolio Share$_{19Q4}$ × High CRE Growth	0.152	0.144	-0.296	-0.098	-0.158	0.241
	(1.118)	(1.106)	(-1.476)	(-0.739)	(-0.736)	(1.308)
Bank Sample	Large	Large	Large	Large	Large	Large
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	31	31	30	30	30	31
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	3,300	3,306	768	872	858	797
R^2	0.366	0.336	0.242	0.321	0.269	0.498

Table A8. Regional Banks: Distress Market-to-Total Distressed Loans - Portfolio Share by Sector.

This table examines how the distress exposure of regional banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Distressed Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{19Q4}$	0.573***	0.593***	0.684***	0.696***	0.639***	0.763***
	(7.284)	(7.799)	(12.119)	(17.021)	(12.094)	(18.581)
Portfolio Share$_{19Q4}$ × High CRE Growth	0.041	0.039	0.068	-0.013	-0.005	0.034
	(0.403)	(0.374)	(0.752)	(-0.176)	(-0.059)	(0.557)
Bank Sample	Regional	Regional	Regional	Regional	Regional	Regional
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	568	568	521	543	525	520
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	11,708	11,708	2,261	3,683	2,932	2,293
R^2	0.429	0.390	0.566	0.581	0.522	0.632

Table A9. Small Banks: Distress Market-to-Total Distressed Loans - Portfolio Share by Sector.

This table examines how the distress exposure of small banks correlated with banks' ex-ante portfolios by markets. Each market is defined as the combination of a geographical area (RCA defined) and one of the property types: Office, Retail, Industrial, or Multi-family. *Distress Market/Total Distressed Loans*, measures the share of distressed loans in a market relative to a bank's total distressed loans, where distress is defined as loans with current LTV higher or equal to 95% in 2023Q4. $PortfolioShare_{19Q4}$ is the portfolio share in market m in the year 2019 and quarter Q4. *High CRE Growth* is a dummy variable that equals one for banks whose CRE loan holdings from 2012 through 2019, scaled by their 2012 total assets, grew more than the 75 percentile within each bank sample. For more detail,s see equation 4. Standard errors are clustered at the bank-level and reported in parenthesis below their corresponding point estimates. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	Distress Market/Total Distressed Loans					
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio Share$_{19Q4}$	0.539***	0.592***	0.310***	0.624***	0.466***	0.519***
	(10.793)	(12.228)	(2.742)	(8.998)	(4.658)	(5.335)
Portfolio Share$_{19Q4}$ × High CRE Growth	0.056	0.050	0.296**	0.034	0.041	-0.099
	(0.641)	(0.527)	(2.011)	(0.389)	(0.322)	(-0.673)
Bank Sample	Small	Small	Small	Small	Small	Small
Property Type Sample	All	All	Office	Retail	Industrial	Multi-family
Number of Banks	1,333	1,333	861	1,072	954	893
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
RCA Area-Sector-Date FE	Yes	–	–	–	–	–
RCA Area-Date FE	–	Yes	Yes	Yes	Yes	Yes
Observations	5,709	5,714	649	1,355	740	599
R^2	0.370	0.324	0.441	0.509	0.406	0.488

B Mortgage and Real Estate Transaction Data

B.1 Sample Construction

We call the combination of all stand-alone mortgage and deed records the transaction sample.

Preparation

1. We begin by restricting the transaction sample to the main records (main record ID = M)

2. Next, we impute missing values for key date variables that are used in the subsequent analysis:

   - Assignment date: the date on which an assignment becomes effective is missing for 7.6% of CRE sample assignments. When missing, we fill in the effective date with the recording date. The median of the difference between the assignment recording date and the assignment effective date is 12 days.

   - Release date: the date on which an a mortgage is paid off is missing for 95.8% of CRE sample mortgage releases and the release effective date is missing in 4.32% cases. When missing, we fill in the mortgage payoff date date with the effective date. When both these dates are missing, we use the release recording date. For the median release, the release is effective 9 days after the mortgage is paid off and the recording date is 6 days after the effective date.

   - Default date: The payment default date is missing missing for 47.5% of CRE sample mortgage defaults. When unavailable we use the lowest of (2) the recording date, (3) the original notice of default recording date, and (4) the auction date.

3. We classify a transaction as a loan if it is from the stand-alone mortgage sample. We classify deed transactions as a loan, i.e., containing a deed of trust, if the transaction has any of the following: (1) positive loan amount, (2) non-missing lender name, (3)

non-missing due date, (4) match with assignment data, (5) match with mortgage release data, or (6) match with default data. Otherwise, we classify the transaction as a deed without concurrent loan.

4. We clean the transaction contract date and the loan due date variables as follows:

   - The original transaction contract date is missing for 6.3% of the transaction sample. When missing, we impute this date by taking the day three weeks prior to the recording date. For comparison, the 75th percentile of the difference between these two dates is 20 days.

   - We set the due date to missing if the due date is before the original contract date. The due date is missing for 52.1% of loans in the transaction sample. For loans with missing due dates, we impute the due date by adding the average time to maturity of all loans with the same original contract date quarter to the original contract date.

Sample Construction

To construct the sample of outstanding loans at date t, we proceed as follows:

1. We begin with the set of all transactions with *original contract date* $\leqslant t$.

2. Keep only the observation with the latest recording date for each property ($DPID$) – original contract date – transaction type to remove transaction duplicates due to re-recording

3. Remove all loans with *release date* $\leqslant t$.

4. Remove loans without release date if *due date* $\leqslant t$.

5. For a given property, remove all transaction that occur before the last deed if any is available.

6. Remove all non-loan observations

7. Variable adjustments and auxiliary variable creation:

- Adjust lender for assignments: For each transaction, use the last assignment with *assignment date* $\leqslant t$ to change the lender to the assignee.
- Last transaction flag: For each property, mark a transaction as last transaction if it has the latest original contract date. If more than one transaction satisfies this criterion, mark only one with the highest loan amount.
- Defaulted flag: For each loan, mark the loan as defaulted if *default date* $\leqslant t$.

B.2 Black Knight - Regulatory Data Match

To match lenders from Black Knight mortgage records to banks' regulatory filings, we take banks' legal title (RSSD9017) from call report filings (FFIEC 031, FFIEC 041, FFIEC 051). To clean both Black Knight and call report names, we preform the following steps:

1. Convert to all caps

2. Replace *&* with " *AND* "

3. Replace all punctuation marks with space

4. Remove leading or trailing word *THE*

5. Remove repeated spaces, and leading and trailing spaces

6. Convert the following words:

(a) *BK*, and *BNK* to *BANK*

(b) *ASSN*, *ASSOC*, *ASSC*, and *ASSO* to *ASSOCIATION*

(c) *NAT*, *NTL*, and *NATL* to *NATIONAL*

(d) *CO* to *COMPANY*

(e) *TR* to *TRUST*

7. Remove trailing *NATIONAL ASSOCIATION*, *NA*, or *N A*

8. Remove spaces between standalone letters, as well as leading and trailing spaces

Next, we match banks in the Black Knight data to their call report RSSD ID using a fuzzy string match. We compute two similarity scores based on the Levenshtein distance between the bank name in the Black Knight data and the bank name in the call reports. First, for two bank names, $Name_A$ and $Name_B$, with c_A and c_B characters, respectively, and Levenshtein distance $\mathcal{L}$ we calculate

$$Total\ Similarity\ Ratio = 1 - \frac{2\mathcal{L}}{c_A + c_B}.$$

Second, without loss of generality assume that $c_A \leqslant c_B$. Let $\overline{Name_B}$ be the c_A-character substring of $Name_B$ with the lowest Levenshtein distance to $Name_A$, $\overline{\mathcal{L}}$. Then, we calculate

$$Partial\ Similarity\ Ratio = 1 - \frac{\overline{\mathcal{L}}}{c_A}.$$

We let the similarity score between two names be the average of their total similarity ratio and their partial similarity ratio. For a bank name in the Black Knight data, we take from the set of bank names in the call report data with similarity of at least 90%, with replacement, the name with the highest similarity ratio.

C Regulatory Data Construction

Federal Reserve Board Z.1. Sector-wide holdings of CRE mortgages come from the Federal Reserve Board Financial Accounts of the United States Z.1. Multifamily mortgages come from L.219 Multifamily Residential Mortgages and commercial mortgage holdings come from Table L.220 Commercial Mortgages. We aggregate (1) *Banks* to include "U.S.-chartered depository institutions" and "Foreign banking offices in the U.S."; (2) *GSE & Agency-backed*

Pools to include "Agency-and GSE-backed mortgage pools," and "Government-sponsored enterprises"; (3) *Insurers* to include "Life insurance companies," "Property-casualty insurance companies"; (4) *Finance Cos, MBS, & REITS* to include "Finance companies", "Issuers of asset-backed securities," "Mortgage real estate investment trusts"; (5) *Other* to include all remaining categories.

Bank-level Data. We collect quarterly bank-level data from Forms FFIEC 031, FFIEC 041, and FFIEC 051. We further collect quarterly consolidated bank holding company (BHC)-level data from Form FR Y-9C. We map banks and BHCs to their parents using the National Information Center relationship files. We take variables from FR Y-9C if available. When consolidated BHC-level accounts are unavailable, we aggregate variables to the parent-level.[6] We define variables as follows, expressed using domestic call report series:

Commercial mortgages. Sum of owner-occupied, non-owner occupied, and pro rated CRE construction mortgages following the definition of the Federal Reserve Board Z.1 Table L.220 U.S.-chartered depository institutions; commercial mortgages; asset.

$$\text{RCONF160} + \text{RCONF161} + 0.8447 \times (\text{RCONF159} + \text{RCONHT67})$$

Multifamily mortgages. Sum of multifamily (5 or more), and pro rated CRE construction mortgages following the definition of the Federal Reserve Board Z.1 Table L.219 U.S.-chartered depository institutions; multifamily residential mortgages; asset.

$$\text{RCON1460} + 0.1553 \times (\text{RCONF159} + \text{RCONHT67})$$

[6]Consolidated BHC-level accounts can be unavailable for three reasons: first, some banks are not part of a bank holding company and are therefore not captured by FR Y-9 reports. An example is Bank OZK. Some banks are part of BHCs that fall below the reporting threshold for the FR Y-9C and report unconsolidated parent company only statements. In 2024 this threshold is at $3bn. Third, some variables are only included in call reports. For example, figures on small business lending are not reported in FR Y-9C.

Delinquent commercial mortgages. We consider mortgages delinquent that are 30 through 89 days, or past 90 days and still accruing, or nonaccruing. Delinquent commercial mortgages are the sum of delinquent owner-occupied, non-owner occupied, and pro rated CRE construction mortgages.

$$\begin{aligned}&\text{RCONF178} + \text{RCONF180} + \text{RCONF182}\\ &+\text{RCONF179} + \text{RCONF181} + \text{RCONF183}\\ &+0.8447 \times (\text{RCONF173} + \text{RCONF175} + \text{RCONF177})\end{aligned}$$

Delinquent multifamily mortgages. We consider mortgages delinquent that are 30 through 89 days, or past 90 days and still accruing, or nonaccruing. Delinquent commercial mortgages are the sum of delinquent multifamily (5 or more), and pro rated CRE construction mortgages.

$$\begin{aligned}&\text{RCON3499} + \text{RCON3500} + \text{RCON3501}\\ &+0.1553 \times (\text{RCONF173} + \text{RCONF175} + \text{RCONF177})\end{aligned}$$

Distressed amended commercial mortgages. Sum of both compliant and delinquent, owner-occupied, non-owner-occupied, and pro rated construction CRE mortgages restructured in troubled debt restructurings.

$$\begin{aligned}&\text{RCONK161} + \text{RCONK114} + \text{RCONK115} + \text{RCONK116}\\ &+\text{RCONK162} + \text{RCONK117} + \text{RCONK118} + \text{RCONK119}\\ &+0.8447 \times (\text{RCONK162} + \text{RCONK108} + \text{RCONK109} + \text{RCONK110})\end{aligned}$$

Distressed amended multifamily mortgages. Sum of both compliant and delinquent, multifamily (5 or more) and pro rated CRE construction mortgages restructured in troubled debt

restructurings.

$$\text{RCONK160} + \text{RCONK111} + \text{RCONK112} + \text{RCONK113}$$
$$+0.1553 \times (\text{RCONK162} + \text{RCONK108} + \text{RCONK109} + \text{RCONK110})$$

Annual commercial mortgage charge-off rate. We calculate year-to-date commercial mortgage chargeoffs as the sum of year-to-date chargeoffs on owner-occupied, non-owner-occupied, and pro rated construction CRE mortgages:

$$\text{RIADC895} + \text{RIADC897} + 0.8447 \times \text{RIADC893}$$

To get the annual charge-off rate, we calculate quarterly chargeoffs by taking the March report values as well as the first difference to the previous quarter for the June, September and December reports. Then, we sum over the last four quarters.

Annual multifamily mortgage charge-off rate. We calculate year-to-date commercial mortgage chargeoffs as the sum of year-to-date chargeoffs on owner-occupied, non-owner-occupied, and pro rated construction CRE mortgages:

$$\text{RIAD3588} + 0.1553 \times \text{RIADC893}$$

To get the annual charge-off rate, we calculate quarterly chargeoffs by taking the March report values as well as the first difference to the previous quarter for the June, September and December reports. Then, we sum over the last four quarters.

Commercial mortgages up to \$1m in size. For banks for which "substantially all of [the] bank's 'Loans secured by nonfarm nonresidential properties' [...] and 'Commercial and industrial loans' [...] have original amounts of \$100,000 or less" we take the currently outstanding

amount of loans secured by nonfarm nonresidential properties

RCON5562

For all other banks, we take the currently outstanding amount of loans with original amounts less than $100,000, between $100,000 through $250,000, and between $250,001 through $1,000,000.

RCON5565 + RCON5567 + RCON5569

Note: A corresponding category does not exist for multifamily mortgages.