

Estimating Today's Commercial Real Estate Risk

To survive a decline in commercial real estate prices such as occurred during the financial crisis, how much more capital do banks today need?

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Since the mid-1990s, banks have increased their commercial real estate (CRE) lending significantly, allowing the CRE market to almost double as a share of the nation's overall economic output. This growing share of CRE mortgages on bank portfolios presents a financial stability challenge, since CRE exposure has been a key determinant of bank failures in the past. As commercial property prices have climbed back up since the financial crisis, CRE capitalization rates—the expected return to investors in commercial real estate¹—have fallen to historically low levels. This fall suggests that commercial real estate prices could be poised to tumble again, potentially causing large numbers of CRE borrowers to default, and leaving banks with steeply devalued CRE mortgages on their books and too little capital to match their liabilities.

This article presents evidence of the link between exposure to commercial real estate loans and bank failure, and then estimates how much more capital banks would need to withstand a decline in commercial real estate values like that observed during the financial crisis. Preventing bank failures and keeping capital levels in a position to absorb losses protects taxpayers because it reduces the expected cost to the federal deposit insurance fund and the likelihood of government intervention in the case that the crisis becomes widespread. Moreover, failures at small banks, which are generally

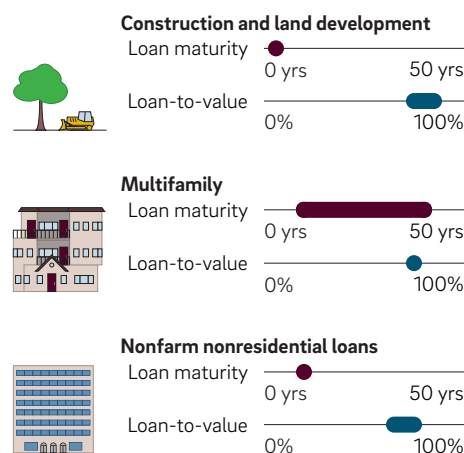
more directly exposed to commercial real estate, tend to disproportionately affect small savers and borrowers.

Small Banks Especially Exposed to CRE

CRE loans finance the purchase or development of almost any type of income-producing property, from offices to retail spaces to industrial locations to multifamily residential complexes.² There are three types of CRE loans, their use depending on the type of property involved and the buyer's objective for it:³

FIGURE 1
Three Types of CRE Loans

Their most common loan maturities and their average loan-to-value ratios.



Source: DiSalvo and Johnston, 2016.

Construction and land development loans cover the cost of acquiring the land and constructing the buildings. Their typical maturity is three years, and their loan-to-value ratio is 75 to 85 percent. This line of credit carries a balloon payment due when construction is completed, and is generally financed by a new loan.

Multifamily loans are used to purchase residential buildings with five or more units. Maturities range from 10 to 40 years, with an average loan-to-value ratio of 75 percent.

Nonfarm nonresidential loans (also referred to as commercial mortgages) are used to buy retail, office, industrial, hotel, and mixed-use properties. The most common length of these loans is 10 years, with a loan-to-value ratio of 65 to 75 percent.

Commercial banks are key players in the commercial real estate market, holding over 50 percent of the outstanding stock of CRE loans on their portfolios in 2016, and are particularly important for the nonfarm nonresidential and construction and land development segments of the market, in which they hold 60.8 percent and 100.0 percent, respectively.⁴

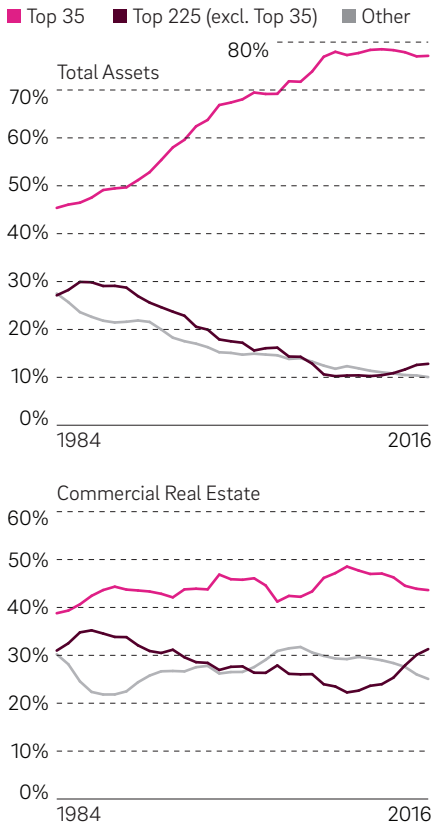
However, within the banking sector, the degree of exposure to commercial real estate mortgages varies substantially by bank size. The top 35 banks hold 75 percent of all bank assets but just 43 percent of the commercial real estate market. The next-largest group of banks—those ranked 36th to 225th in terms of total assets—hold

FIGURE 2

Degree of CRE Exposure Varies

Total assets and CRE exposure.

Market shares by bank size



Source: Federal Reserve Call Reports.

30 percent of CRE assets. Small banks—all those not in the top 225—hold 27 percent of the market (Figure 2).⁵

Although small banks hold the smallest slice of the CRE market, the historical evidence hints that in terms of the share of their loan portfolios, small banks tend to specialize in commercial real estate and are more exposed to this market than large banks are (Figure 3).⁶

Small banks' CRE holdings account for 30 percent of their total assets, compared with just above 5 percent for large banks. And small banks' specialization in commercial real estate has increased over the last few decades. Their specialization in CRE has been driven mostly by construction and land development loans and nonfarm nonresidential mortgages (Figure 3), which have higher rates of default than other commercial real estate loans and, as discussed here, are a main driver of the link between commercial real estate and bank failure.

At the peak of the last financial crisis, commercial real estate loans accounted for almost 50 percent of small banks' total loans. Today, even after the decline of the real estate market during the crisis, that fraction remains above 40 percent, suggesting that concentration in the commercial real estate loan market remains elevated. The largest banks have increased their exposure to multifamily loans since the crisis, but their share of CRE loans as a fraction of their total loans has always been relatively low, just above 15 percent in 2016.

CRE Exposure Determines Bank Failure

Historically, the commercial real estate market has been cyclical, with relatively pronounced oscillations between economic expansions and recessions. Its cyclical properties make banks that concentrate their lending in this sector particularly vulnerable and can amplify business cycles via bank failure and reduced lending.

Evidence shows that high exposure to CRE lending, when coupled with depressed CRE markets, has contributed to significant credit losses and bank failures in the past.⁷ Two supervisory criteria—described in a 2006 regulatory guidance by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC)—provide good benchmarks for evaluating whether a commercial bank is overexposed to the CRE market:

If its holdings of construction and land development (CLD) loans represent 100 percent or more of its total risk-based capital, then the bank is **High CLD**.

If its holdings of CRE (including CLD) loans represent 300 percent or more of its total risk-based capital and have increased by 50 percent or more during the previous 36 months, then the bank is **High CRE**.

At any point in time, a significant fraction of banks is highly exposed to the fluctuations in CRE prices (Figure 4).⁸

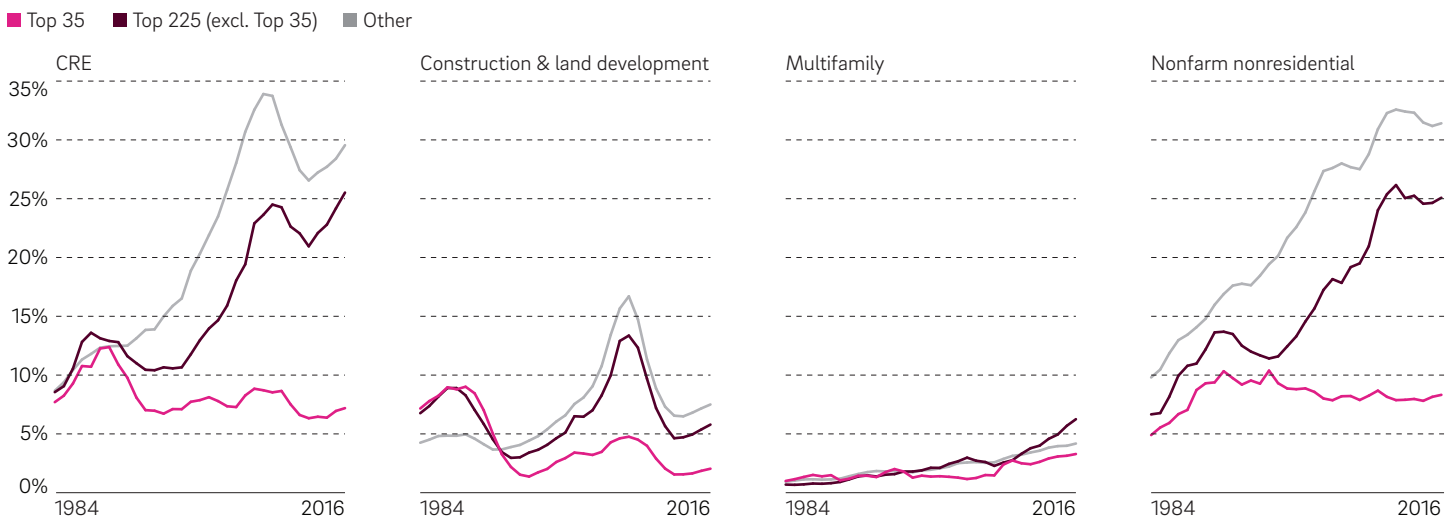
As Figure 4 also makes evident, CRE loan exposure has a local peak in the

FIGURE 3

Postcrisis Exposure to CRE Still Elevated

Loan portfolio specialization by bank size.

Loans-to-assets ratio for different loan types

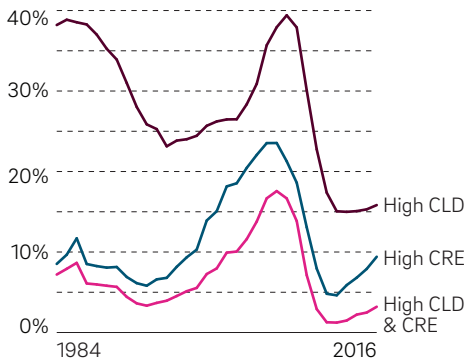


Source: Federal Reserve Call Reports.

FIGURE 4

Significant Share Highly Exposed to CRE

Percentage of banks with high exposure to the CRE market since 1984.



Source: Federal Reserve Call Reports.

Note: High CLD & CRE refers to institutions that satisfy the criteria for High CLD and High CRE.

mid-1980s and another in the mid-2000s. Both peaks were followed by surges in bank failures that, among other factors, the literature has identified with downturns in the CRE market.

To illustrate how relevant CRE exposure has been for bank failures, we can trace the evolution of the number of commercial banks that have failed since 1984 and compare the failure rates for all banks and for banks conditional on their degree of CRE concentration (Figure 5).

The banking crises in the late 1980s and the 2008–2009 financial crisis resulted in a large number of bank failures.⁹ In both episodes, there were major differences in failure rates for banks above and below the concentration levels specified in the interagency guidance. Failure rates for banks that exceeded the criteria were three to four times higher than those of the rest of the banks. Most failures in the late 1980s occurred among banks that had high overall CRE exposure, and most failures in the last crisis were among banks with high CLD concentrations.¹⁰

The Crisis of the Late 1980s and Early 1990s

During a boom in commercial real estate lending in the early 1980s—primarily in the Southwest, Alaska, Arizona, the Northeast, and California—CRE loans tripled, which was followed by a rapid decline in the value of real estate in 1989 and 1990, leading to a large fraction of nonperforming or foreclosed commercial real estate loans in 1991.

What triggered the fantastic increase in CRE lending? One of the factors that the literature has identified (see James Poterba's article) was the tax incentives included in the 1981 tax reform, the Economic Recovery Tax Act of 1981. Total

multifamily starts rose from 390,000 in 1981 to 670,000 in 1985, with virtually all of the increase in large buildings. What triggered the decline? Further changes in tax policies had also been identified as the drivers of the decline. The Deficit Reduction Act of 1984 and the Tax Reform Act of 1986 reversed most of the changes of the 1981 tax law. The net effect has been a reduction in the tax incentives to rental construction.¹¹

Many of the banks that failed had actively participated in the regional real estate market booms, particularly in commercial real estate. In 1991, the commercial real estate loan-to-asset ratio for banks that failed was close to 30 percent, while the same ratio for banks that continued operating was just above 10 percent. Commercial real estate loan exposure among banks that subsequently failed was significantly higher than for those that did not fail.

The Last Financial Crisis

In response to increased competition in the consumer and residential real estate loan markets during the early 2000s, small banks—generally referred to as community banks—turned increasingly to commercial real estate lending (Figure 3).¹²

During the early 2000s and until the issuance of the interagency guidance, the fraction of banks with large CRE exposures grew steadily (Figure 4). In 2006, just before the crisis, 40 percent of all commercial banks in the U.S. had high CLD concentrations, and close to 20 percent had high CLD and CRE concentrations. As the crisis deepened, deteriorating conditions in the residential mortgage market that had begun in 2007 spilled over

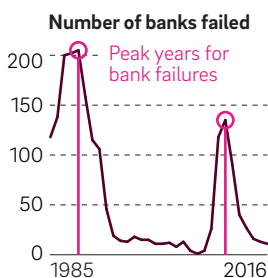
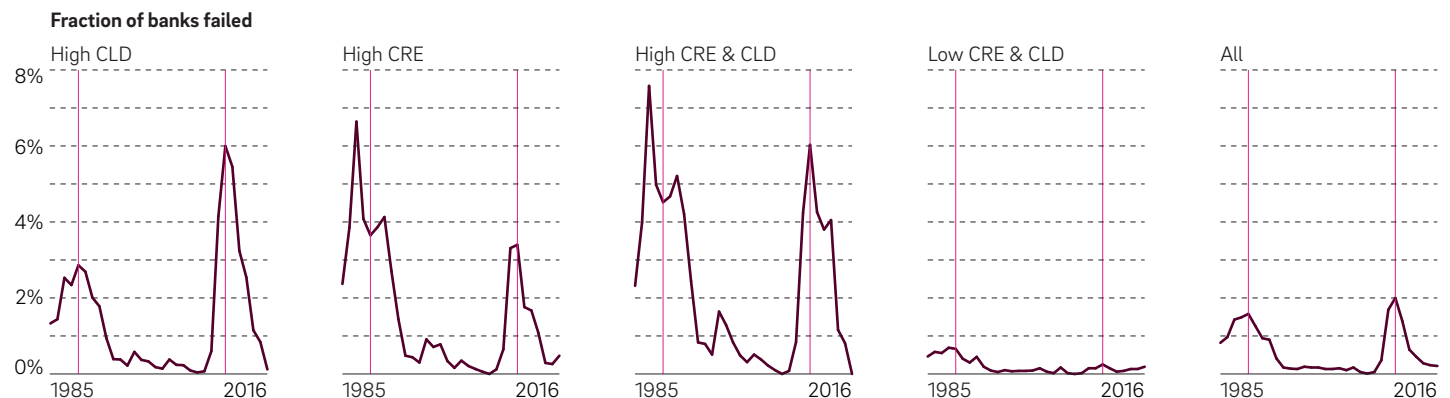


FIGURE 5

High Concentrations Correlate with Bank Failures

Number and rates of bank failures. 1984–2016

Note: High CLD & CRE refers to institutions that satisfy the criteria for High CLD and High CRE, and Low CLD & CRE refers to institutions that do not satisfy either of the criteria.



Source: Federal Reserve Call Reports.

to the CRE market in 2008.¹³ One important link between the two markets was that many banks had made loans to developers for the purpose of constructing multifamily residences, and demand for these residences fell sharply in the recession. The CRE price declines—on average, more than 42 percent between the peak in 2007 and 2010—had very negative consequences for the financial sector.

The percentage of CRE loans that banks had to write off from the end of 2007 through the end of 2010 was 10 times higher than it had been between 2000 and 2007. As in the previous crisis, banks that were more exposed to commercial real estate suffered much more. Commercial real estate loan delinquencies were not as high as delinquencies in the residential real estate market but also increased dramatically. Yet, charge-off rates for commercial real estate loans were higher than charge-off rates for residential real estate loans at the peak of the crisis, with CRE charge-offs driven primarily by land, development, and construction loans.

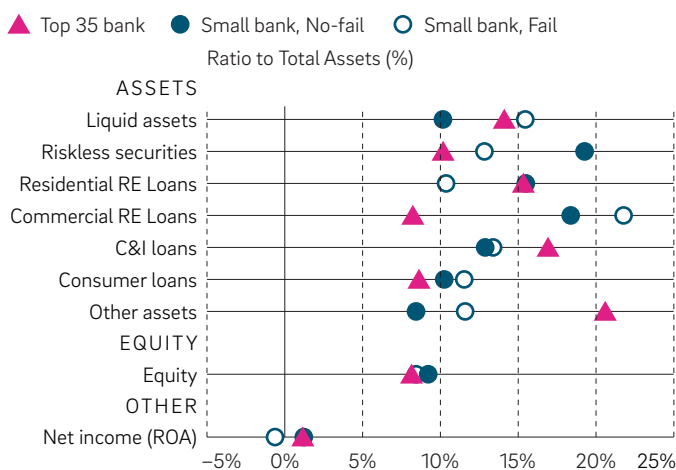
Are there other relevant differences between the banks that failed and those that did not? To shed some light on the factors influencing bank failure—and in particular whether there are significant differences in commercial real estate exposure—we can compare the balance sheet composition for large versus small banks, and in the case of the small banks, for those that failed versus those that did not fail during the financial crisis (Figure 6).

As Figure 6 shows, small banks held more safe assets (liquid assets such as cash plus riskless securities such as U.S. Treasury securities) and were more exposed to commercial real estate. Their higher holdings of securities derives from differences in the cost of borrowing between small and big banks, geographic diversification, and the volatility of their deposit base, as small banks are more exposed to local fluctuations. Moreover, those that failed were more exposed to commercial real estate than those that did not fail and had a negative net income, or return on assets (ROA).

FIGURE 6

Small Banks That Failed Were More Exposed to CRE

Balance sheet composition by bank size and small bank failure. 1984–2016



Source: Federal Reserve Call Reports.

Note: We define large banks as those in the top 35 of the asset distribution and small banks as all the rest.

Current Vulnerability: Stress-Testing CRE Exposure

Although commercial real estate valuations have increased considerably since the end of the crisis and capitalization rates have declined to historical lows, the recovery in CRE prices and sales volumes is beginning to slow. There are indications that demand for CRE loans has weakened and that lenders are tightening lending standards, according to recent Senior Loan Officer Opinion Survey results.

Even though capital regulations have been strengthened and bank risk-weighted capital ratios have increased in recent years, the rise in real estate prices and declines in capitalizations raise questions about the vulnerability of banks exposed to the CRE market.¹⁴ In addition, declines in CRE market values could reduce overall small business lending by community banks.

But how can we quantify the current level of risk in the system posed by CRE lending? To estimate this risk, I perform an experiment that computes capital losses across banks using CRE delinquency rates and loss-given-default rates observed during the last crisis.¹⁵ With a measure of delinquencies and losses at hand, it is possible to estimate the losses that banks would stand to incur in their CRE holdings under circumstances similar to those of the last crisis and from this estimate derive the reduction in bank equity that banks would sustain (Figure 7).¹⁶

For example, if a bank's CRE holdings equal \$100, and 10 percent of those loans default, with an average recovery rate of 70 percent, the bank's portfolio will be reduced by \$3. If its ratio of CRE loans over risk-weighted assets is 33 percent—its risk-weighted capital due to the losses suffered in the CRE portfolio is reduced by 0.01 (= \$3/\$300). Then, if the bank's capital buffer over and above the minimum required is less than 1 percent, its capital ratio will slip below the minimum.

This approach uses as a starting point the 4Q2016 distribution of CRE loans and capital ratios, and provides a distribution of bank capital losses.

While similar in spirit, this experiment differs from the formal stress test that the Federal Reserve conducts, since it does not use loan-level data or an explicit model to calculate loan losses, and it evaluates the losses suffered only during one period as opposed to an extended period. In this respect, the results of the exercise should be viewed as a lower bound on potential losses.¹⁷ While informative, this experiment is not designed to capture the effects of a protracted crisis in the CRE market, in which case banks are hit with repeated, consecutive losses, including those deriving from the linkages across banks, commercial real estate markets, and other asset markets.¹⁸

One question that arises when performing this type of experiment is whether CRE loans are particularly toxic. The results show

FIGURE 7

Stress Effects

Predicted losses in 4Q2016.

Capital Losses

0.4% 0.1%
AVERAGE MEDIAN

Buffer over Minimum

5.6% 5.3%
AVERAGE MEDIAN

Source: Call Reports Federal Reserve Bank.

Note: Uses CRE delinquency and loss-given-default rates across banks during 2008–2009. Capital Losses is ratio of capital to risk-weighted assets lost due to CRE losses. Buffer over Minimum is amount of excess capital over minimum that banks hold after sustaining CRE losses.

that losses in this portfolio have the potential to affect a large swath of small banks. On average, banks currently have enough capital to remain adequately capitalized even after suffering losses as large as those observed during the last crisis (Figure 7).


The average bank has a capital buffer of more than 5 percent. However, this statistic paints over wide differences in CRE exposure and capital ratios similar to those documented for previous crises. A more in-depth analysis shows that when exposed to this stress scenario, 117 banks—2.3 percent of the total number of banks, holding 0.4 percent of the aggregate value of assets and 1.3 percent of the value of CRE credit—would fall below the 7.25 percent Tier 1 capital ratio required.¹⁹

This number should be understood as a lower bound on the potential effects of a stress scenario, not only because of the static nature of the experiment but also because, as Figure 6 shows, banks with capital ratios that were well above the minimum required had failed. For example, the value of the bank for its shareholders can become negative before capital reaches the minimum required.

Moreover, banks that are vulnerable to CRE price declines do not overlap exactly with those that have the largest CRE concentrations. Approximately 50 percent of those that go below the 7.25 percent capital threshold in the experiment have high concentration ratios. Other banks with high concentrations have capital ratios substantially above 7.25 percent and are able to absorb the losses, but their reduction in capital ratios also has the potential to reduce lending.

This stress experiment induces a clear shift in the distribution of risk-weighted capital closer toward the minimum. If banks are currently operating at or close to their optimal level of capital, this shift implies that losses in the CRE market could curtail lending or other asset markets and impede the normal operation of most banks in the industry.

Conclusion

This experiment shows that while the financial system appears to be better prepared for a shock in the CRE market now than it was leading up to the financial crisis, in the event of another such crisis, most banks would be affected, and many might fail. The CRE sector remains a potential source of instability for the banking sector. 

Notes

- 1** More specifically, capitalization rate refers to the ratio of a property's annual net operating income to its price.
- 2** I use a conservative definition that excludes loans secured by farmland.
- 3** See James DiSalvo and Ryan Johnston's 2016 *Banking Trends* article for a description of the commercial real estate market.
- 4** The other half of commercial real estate mortgages ends up in the hands of other investors, such as insurance companies, government agencies, and private investors, or in a pool of mortgages such as commercial mortgage-backed securities (CMBS).
- 5** Banks in the top 35 have assets above \$50 billion, banks ranked 36th to 225th have assets between \$3 billion and \$50 billion, and all those not in the top 225 have assets below \$3 billion (measured in 2016 dollars).
- 6** Large banks originate a large fraction of CRE loans, but they tend to securitize a much larger fraction of these loans than small banks do.
- 7** See the Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, and the Board of Governors of the Federal Reserve System's "Guidance on Concentrations in Commercial Real Estate Lending, Sound Risk Management Practices" and the Federal Deposit Insurance Corporation's 1997 "History of the Eighties—Lessons for the Future," <https://www.fdic.gov/bank/historical/history/>.
- 8** See Keith Friend, Harry Glenos, and Joseph Nichols's article, "An Analysis of the Impact of the Commercial Real Estate Concentration Guidance," for a detailed description of the guidance and its implications for loan growth and bank failure.
- 9** The estimate of bank failure is very conservative. Mergers are separated from clear failures, since the reasons banks fail can be different from those that result in a bank merger. However, several bank mergers were driven by the same fundamentals that drive bank failures—low returns on assets, declines in charter value, and exposure to risky assets. Similarly, a number of banks would have failed but for government bailouts. All the banks that actually failed were outside the top 35.
- 10** The Eliana Balla, Laurel Mazur, Edward Prescott, and John Walter article analyzed the factors driving bank failures during the crisis of the late 1980s and the most recent financial crisis extensively. Consistent with previous literature (for example, the articles by David Wheelock and Paul Wilson, George Fenn and Rebel Cole, and Rebel Cole and Lawrence White), they find that CRE, and in particular construction land and development loans, is the main factor driving failure probabilities.
- 11** The Tax Reform Act of 1986 created the Real Estate Mortgage Investment Conduit, facilitating the issuance of mortgage securitizations, including commercial mortgage-backed securities (CMBS).
- 12** In 2003, banks with assets of \$100 million to \$1 billion had commercial real estate portfolios equal to 156 percent of their total risk-based capital, and this ratio increased to 318 percent in 2006.
- 13** Adonis Antoniadou's article describes the link between residential real estate and commercial real estate.
- 14** Besides cyclical fluctuations in commercial real estate prices, other risk factors include fluctuations in the CMBS market and softness in the retail sector that could impact the value of collateral used in CRE loans.
- 15** For each commercial bank, the delinquency rate on CRE loans during the crisis is computed as the maximum (yearly) delinquency rate on CRE loans observed during years 2008, 2009, and 2010. The values reported in Figure 5 refer to the average (or the median) across banks. The loss-given-default is computed as the average during the crisis.
- 16** In addition to delinquency rates and the loss-given-default, estimating capital losses requires a measure of the loan loss provision (the ratio of the provision for loan losses over total loans), the ratio of CRE loans to risk-weighted assets, and the current level of capital over risk-weighted assets for each bank. At the height of the last crisis, average nonperforming CRE loans was 7.75 percent, and loss-given-default CRE loans was 30.27 percent.
- 17** See the Jihad Dagher, Giovanni Dell'Ariccia, Luc Laeven, Lev Ratnovski, and Hui Tong article for a similar approach used to estimate appropriate levels of bank capital during a crisis.
- 18** These factors include the spillovers from one commercial real estate market to another via securities prices or a reduction in lending by banks affected by the initial shock as well as linkages across banks that disrupt the normal flow of credit when one of the links in the network is in distress.
- 19** The minimum Tier 1 risk-weighted capital required is 6 percent plus a 1.25 percent conservation buffer in 2017. The conservation buffer will increase to 2.5 percent in 2019.

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