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House Prices and Bank Loan Performance

The current financial crisis in the United States has its roots in falling real estate values. Indeed, a number of studies have shown a strong link between house price depreciation and defaults on residential mortgages (Doms, Furlong, and Krainer 2007). This *Economic Letter* reports on new research (Krainer 2008), which looks at the performance of commercial banks and finds further evidence on this link. The study also finds that the performance of land development and construction loans is even more sensitive to house prices than the performance of residential mortgages, consistent with very high delinquency rates on the former set of loans. At the same time, the study finds little evidence that spillovers from falling house prices have materially affected the performance of other types of loan categories at commercial banks.

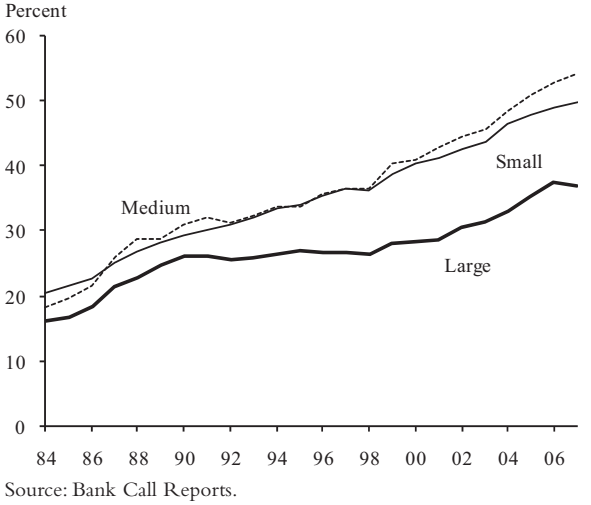
Bank exposure to real estate

The U.S. real estate market is very large. According to the Federal Reserve's flow of funds data, as of 2008:Q1, U.S. households and nonprofits held about $22 trillion in real estate assets (mostly residential properties), and businesses (corporations and noncorporate entities) held $16 trillion; these sums do not include foreign or government holdings. Supporting these real estate assets is nearly $15 trillion in mortgage debt. For purposes of comparison, households owe about $2.5 trillion in consumer debt, and U.S. businesses (nonfarm and nonfinancial) owe about $11 trillion. Banks are exposed to real estate markets in several ways. Most directly, banks extend loans (usually mortgages) to households, developers, and businesses. Over the past several decades, the commercial bank share of total real estate lending has slowly declined as other lenders have entered the market. At the same time, however, the percentage of total bank assets exposed to real estate has increased for banks of all sizes (see Figure 1). In the mid-1980s, for most banks, about 20% of total bank assets were exposed to real estate, and today, the exposure is about 50% for small banks (under $500 million in year 2000-level dollars) and medium-sized banks ($500 million to $1 billion in 2000-level dollars) and just under 40% for large institutions. This basic trend is even more pronounced when considering real estate loans as a share of the total loan portfolio: banks now devote about three-quarters of their total loan portfolios to real estate lending.

The patterns of change in real estate exposure are quite different, however, by category of real estate. Large banks have kept their share of nonresidential lending (measured here as nonresidential plus construction and land development loans) fairly constant at 40% over the past 15 years. In contrast, small and medium-sized institutions have increased their exposure to nonresidential and construction lending at a faster pace than to residential lending. The construction and land development segment has been one of the most important sources of growth for small and medium-sized banks. For small banks, outstanding construction loans have grown by a factor of four over the past two decades. While we tend to think of construction loans as nonresidential loans, about two-thirds of the aggregate outstanding construction loans were for the development of one- to four-family residential properties in 2007:Q4.

Banks also hold mortgage-backed securities (MBS) not only directly on the balance sheet, but also off the balance sheet in the form of loans sold to securitizers with some kind of recourse. These MBS

Figure 1
Real estate loans and MBS as a percent of total assets, by bank size



Source: Bank Call Reports.

are either purchased in the market or obtained after swapping newly originated mortgages with a government sponsored entity (GSE), such as Fannie Mae. Like the loans held in portfolio related to real estate, MBS holdings have also more than doubled over the past decade, although most of this growth came at the large banking institutions.

The link between real estate prices and bank performance

Why do falling real estate prices lead to increased default rates and losses at banks? To illustrate, consider a homeowner who faces an unfortunate change in circumstances—such as illness, divorce, or job loss—that makes it too hard to keep up with the mortgage payments. An environment where house prices have been rising can ease the situation for both the homeowner and the bank. For the homeowner, the chances are good that he can get out from under the mortgage by selling the house, because it is likely to be worth more than the value of the mortgage; in addition, he would avoid the costs and penalties associated with default. For the banker, even if the borrower defaults, the rise in home prices means that the collateral against which the mortgage was made is now worth more. If, in contrast, house prices have been falling, the situation can be grim for both the homeowner and the bank. For example, the homeowner may find that in the current market, the house is now worth *less* than the mortgage; since selling the house would not provide enough funds to pay it off, the homeowner may conclude that default costs are less onerous than trying to maintain the mortgage. In this scenario, banks suffer as well, because not only do they have to write down the defaulted loan, but they also have to write down the value of the collateral, since the house is now worth less.

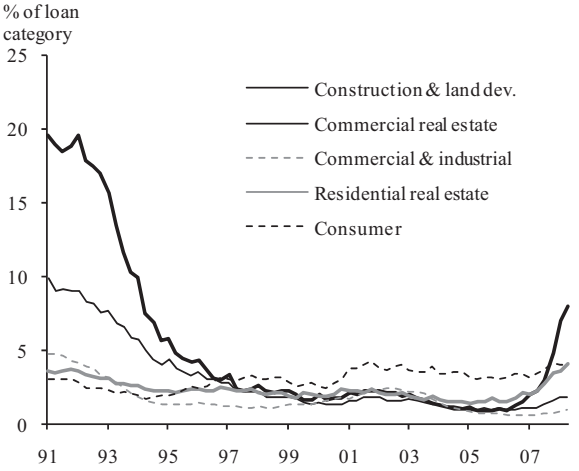
Falling real estate prices also may spill over to affect the performance of other bank loan categories. Local house prices can be thought of as proxies for the value of land. Since land is a component of the collateral backing nonresidential real estate loans and other land development loans (see Davis and Heathcote 2007), falling house prices may coincide with changing incentives to default on these loans as well, for the same reasons described above. Additionally, housing wealth constitutes a large share of total household wealth. If house price declines are unanticipated, then it is possible that previous spending levels and debt burdens will need to be adjusted, which could result in defaults on other loans.

Measuring the impact of falling house prices on bank performance

In Krainer (2008), I study the impact of house price changes on the future share of nonperforming loans (NPL) at commercial banks. I look for two types of spillovers from fluctuations in real estate prices to banking performance: direct spillovers, where default rates are affected for loans that are secured by those properties, and indirect spillovers, where default rates are affected for loans that are not backed by residential real estate properties, such as nonresidential real estate loans or consumer loans.

Figure 2 shows that, in 2007, a period when house prices were beginning to fall in a number of real estate markets, there was a clear uptick in many bank NPL categories, particularly residential and construction. We can measure this basic relationship much more precisely when we use bank-level data and attempt to identify bank lending markets with local real estate prices. The evidence suggests that the spillovers from house prices to bank loan performance can be sizeable. For example, a modest 1% increase in quarter-to-quarter house prices cumulates over the next four quarters to hold down the NPL ratio for the residential portfolio by about 0.09 percentage points, or nine basis points, and the average residential NPL ratio itself fluctuates in a relatively narrow 70-basis point band (between 0.8% and 1.5%). To get a sense of what this analysis would mean for the present day, the

Figure 2
Nonperforming loans at commercial banks



Note: Loans 30 days or more past due, seasonally adjusted.
Source: Bank Call Reports.

average quarter-to-quarter price change in the Case-Shiller national home price index is about –4%, which would translate into a 0.36 percentage point increase in NPL ratios over the next year.

Not surprisingly, construction NPL ratios also are quite sensitive to changes in house prices. By far the majority of construction loans are for residential development, and local house price changes are expected to be a very good proxy for changes in expected and current revenue on these construction projects. In total, a 1% change in local house prices is associated with a cumulative impact of about –0.4 percentage point on the construction NPL ratio over the following four quarters. The measured impact of house prices on construction loans is the largest spillover effect measured in this paper.

Other nonresidential NPL ratios do not display as much response to house price shocks as does the residential real estate loan portfolio. This could be because house prices are not a good proxy for the ability of nonresidential borrowers to repay their loans. There were no statistically significant effects of house price changes on the performance of the consumer loan portfolio.

The research also documents differences in the response of NPL ratios to house price changes in different time periods. The response of construction NPL ratios to house price changes was about six times larger in the early 1990s than in the last 10 years. The explanation is not simply that NPL ratios cannot respond beyond a certain point (the NPL ratio is either zero or positive) during good times; this can be controlled for statistically. Rather, the explanation could be that bank lending standards change over time (Demyanyk and Van Hemert 2008), or that other economic forces not captured in the empirical analysis somehow weigh more heavily on borrowers during times of weak house price appreciation.

Conclusion

The evidence suggests that spillovers of real estate shocks into bank performance are strongest for those types of loans where the collateral is some type of real estate. Spillover effects are strongest for residential loans and construction loans, followed by nonresidential loans. Importantly, all measured effects appear to be much stronger in the 1990s than in the 2000–2007 period. Given that we are currently in a period of declining house prices, it may be reasonable to assume that loan performance will behave more like the observable relationships from the 1990s.

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