

Mortgage Risk

Get a fix on floating-rate risk

Chris Marrison examines the challenges of quantifying interest rate risk in commercial real estate portfolios

One of the major manifestations of the current market crisis is the increased volatility in short-term interest rates such as three-month LIBOR. This development has reminded commercial real estate lenders of the risk posed by floating-rate loans.

Over the last decade, there have been four principal forces pushing lenders away from fixed-rate loans: forgetfulness, borrowers, treasuries, and mislaid risk. The forgetfulness is simply that interest rates have been stable for as long as many borrowers and lenders have been in business. Only the most senior participants remember the early 1980s when UK rates were around 16% or 1990 when rates were 15%. Most people in business today have only experienced rates around 5% and find it hard to imagine that interest payments could triple.

From the borrower's perspective, floating interest rates provided a lower cost of funds, which has been especially important for the highly leveraged deals. Borrowers share the same short to medium-term memory of interest rates as lenders and they are less concerned about extreme cases because in the very worst case, they could simply go through foreclosure and give the property to the bank.

Within banks, there was a more subtle mechanism playing out. Most receive funding from short-term deposits, or from other banks who themselves are funded with short-term deposits. If banks give customers long-term loans with fixed rates, they risk having the sort of interest rate crunch suffered by the US savings and loans institutions in the 1970s when their funding



costs rose but their income from long-term mortgages remained fixed.

This risk has subsequently been recognized within treasury funding operations and one of the fundamental tasks of asset liability management today has been to reduce the interest rate gap. This has led treasury departments to encourage their lending departments to give loans with payments tied to short-term LIBOR.

Returning the risk

The consequence of encouraging floating-rate lending is that the interest rate risk has been moved away from treasury and put onto the customers. To some extent, customers may be naturally hedged because their rental income tends to rise with inflation and interest rates. However, the customers are only able to absorb a limited amount of interest rate increases before they return the risk to the bank by defaulting on the loan. Effectively, by having the lending rates tied to short-term LIBOR, the interest rate risk in

the treasury department has transformed into credit risk in the lending units.

The last of the forces pushing lenders away from fixed-rate loans is the mislaid risk. When the risk was moved from the treasury to the customer, it moved from an environment where the risk was measured and managed into an environment where it was unseen.

This disappearance came about because most credit risk models take little or no account of interest rate risk. Even within the Basel II framework, banks are encouraged to view the probability of default as being an attribute that belongs to the customer alone, independent of the financing structure (the financing structure is said to only affect the loss given default). In many asset classes, the link between the loan characteristics and the probability of default is unclear, but in commercial real estate it is obvious that if the income comes from fixed leases and the debt is floating, the deal will default if rates move too far.

Now that interest rate risk has returned to the fore, there are two sets of questions to be asked: how should interest rate risk be managed across the bank as a whole and what can be done about the floating rate deals already on the books? If we look again at the four primary forces that encouraged floating-rate lending, the first force,

forgetfulness, can be cured by the current market crisis and ensuring that risk models take into account long-term historical events and data.

The second force was the request from borrowers for floating-rate funding. This is automatically cured if interest rate risks are

taken into account in credit risk models because the increased risk of floating-rate loans is translated into an increased margin, thereby making them less attractive.

Integrated view

The last two forces moving risk out of the treasury to the lending units can be countered by explicitly modeling the risk of interest rate movement into the credit models and asking treasury to hedge the part of the credit risk correlated with interest rate movements. This last step requires an integrated view of the interest rate risk across the entire portfolio.

At the deal level, most banks have gone some way to measuring the credit risk caused by interest movements by using stress testing. A typical stress test will ask, “how many of my deals will have a debt-service coverage ratio (DSCR) less than 1 if rates go up by 2% per year for four years?” For commercial real estate portfolios this question is difficult to answer because of the complexity of the deals—the start of floating rates may be different for different loans within the deal, there may be refinancing of some of the loans; there may be interest rate caps, they may have sweep covenants that kick-in when the DSCR starts to decline, and the lease terms may reset to market rental rates that are themselves correlated to interest rates.

To assess the portfolio, banks typically try to address the stress testing by manually pulling together as much information as they can and then making sufficient simplifying assumptions so that the calculations are tractable. Some banks are now trying to build or install calculators that assess deals one-by-one in full detail but this task can take years to achieve.

Once the system is completed, detailed automatic stress testing across the whole portfolio gives managers a good insight into the degree to which the portfolio is exposed to market movements and can identify risky loans, but stress testing can be misleading because they test the deals in a limited set of conditions. The following illustration shows the assessment of a deal using first, stress testing and then simulation.

For this example the deal is one loan with a maturity of 10 years and interest payments tied to LIBOR. The loan is supported by cashflows from a single property with 12 tenants. The lease payments are fixed and the leases expire over 15 years, with the lease of the largest tenant expiring at the eight-year point. The loan-to-value ratio is 72%, DSCR is 1.5 and the interest service coverage ratio (ISCR) is 1.7, based on an initial value of 4.8% for LIBOR. This deal reaches a DSCR of one if LIBOR reaches 7.5%—therefore it clearly has interest rate risk.

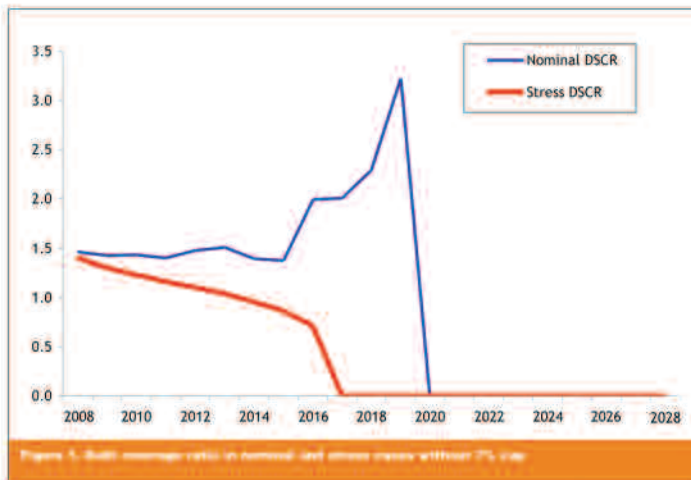


Figure 1. Debt coverage ratio in nominal and stress cases without 2% cap

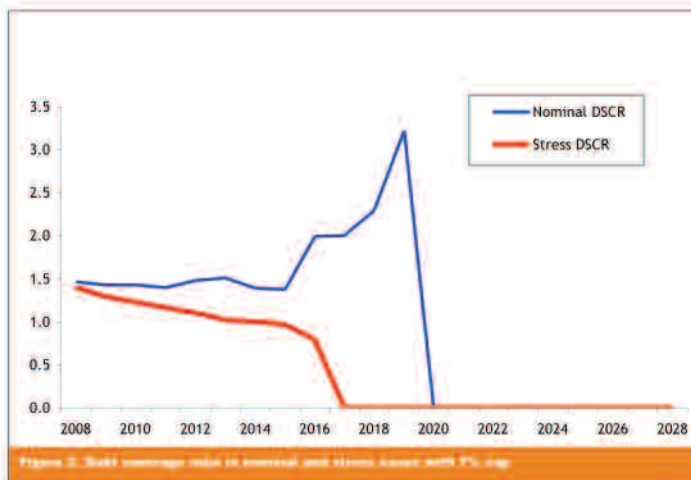


Figure 2. Debt coverage ratio in nominal and stress cases with 2% cap

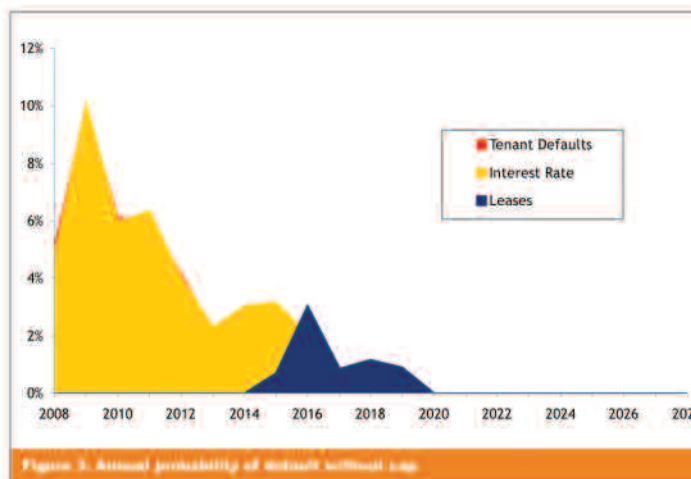


Figure 3. Annual probability of default without cap

Figure 1 shows the DSCR of the deal under nominal forecast conditions and in a stress case where interest rates rise 25 basis points per year and re-letting rental rates fall by 30%. In this stress case, the DSCR reaches 1 in 2014 and foreclosure happens a couple of years later.

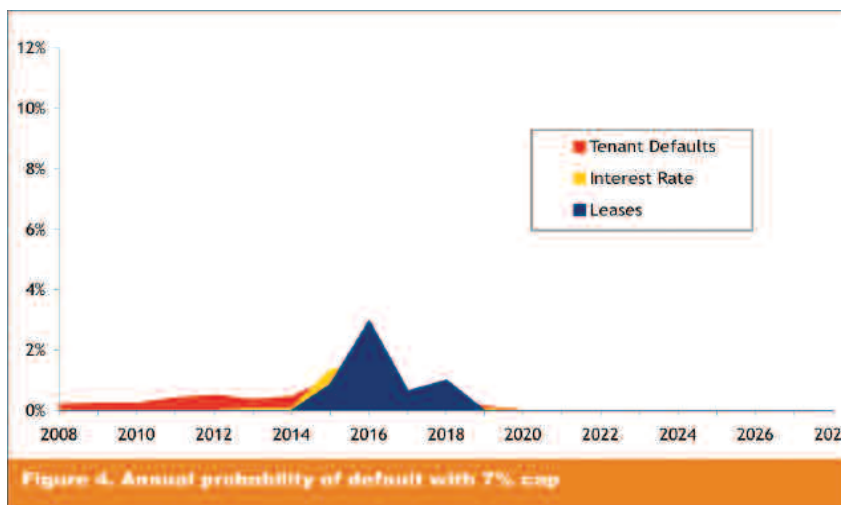
Figure 2 shows the same deal but with an interest rate cap set at 7%. This seems to improve the stressed DSCR but the deal still forecloses in 2016. A more severe stress on interest rates would have shown some added benefit from the cap, but this also illustrates problems with stress testing, that is, defining which scenarios are “unlikely but reasonably possible.”

Figures 3 and 4 show alternative views of the risk by using simulation to test the deals under thousands of alternative market possibilities. These figures show the probability of default for each year of the deal’s life. In the base case, the primary risk is from defaults caused by interest rate movements, with secondary risks around the year when the lease for the major tenant expires.

In Figure 4 the lease risk still occurs, but it shows that the cap eliminates the interest rate risk almost completely, leaving just some residual risk from the possibility of tenant defaults. These examples show that stress testing alone can be inadequate in assessing the risk and that a more integrated approach, such as cashflow simulation can provide is required.

What can be done now?

This brings us to the last question: what can be done about floating-rate loans that are already on the books? Many existing loans will be reasonably safe either because they have caps already, they have good ISCRs, they have reserves to absorb interest rate rises, or their lease structure is also somewhat floating (there is a 40% to 50% correlation between increases in interest rates and increases in rents when the leases renew to market levels).



Many lenders and their models have undercounted the extent to which credit risk is driven by interest rate risk

The good loans are separated from the bad by running all the deals in the portfolios through a risk model, assessing their total potential loss and the portion that is attributable to interest rate movement.

Concentrating on the most risky deals, the lender can then try different caps (e.g., at 6%, 7%, 8%) to determine the amount of credit risk that could be removed by each cap and, therefore, whether the reduction in risk will be sufficient to pay for the cap. The lender can then go to the borrower and offer to lower the rate a little if the borrower buys a cap.

There should be a net saving between the lender and the borrower if they can restructure the deal to avoid the legal costs of foreclosure and the possibility of selling the property into a flooded market.

In summary, many lenders and their models have underestimated the extent to which credit risk is driven by interest rate risk, which could cause widespread consequences across the commercial real estate industry. These problems can be prevented, mitigated, or, in some cases, reversed by explicitly quantifying the interest rate risk. However, common tools like stress testing have serious limitations and more integrated approaches such as cashflow simulation are required to get a complete picture of the risk. ■

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