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Commercial real estate portfolio managers are under increasing pressure to adequately structure and report on their deals as concern grows about the outlook for the market.

Chris Marrison, of Risk Integrated examines the latest approaches to the task

Protecting commercial real estate portfolios

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Commercial real estate (CRE) makes up approximately half of all real estate assets. As the US retail market melted down this summer, commercial loans appeared to escape largely unscathed – with the exception of the illiquidity in the market for mortgage-backed securities (MBS). The CRE business is very different from the retail business but there are strong economic ties between the two and concern is growing over the possibility of a significant fall in the global CRE market. In this uncertain atmosphere, CRE lenders are under pressure to ensure that their assets are well structured (or restructured) to withstand adverse conditions and to provide detailed reports on their portfolios to reassure board members and investors. With portfolios of thousands of assets it can be a major task to identify and mitigate the key sources of risk.

The managers of CRE portfolios face significantly different challenges to those with retail portfolios – the most obvious being that individual CRE loans are bigger so the loss of any single loan can put a large hole in profitability. Given their size, CRE loans are more carefully structured, often with complex features tailored to the requirements of an individual transaction. The structure of the loans,

combined with the structure underlying the lease income, typically creates a complex multi-year pattern of risk with spikes often occurring in years that see changes to the lease, sales of underlying properties, or expiration of interest rate hedges. CRE deals also contain features not found in retail mortgages, such as multiple properties that generate cashflow in multiple currencies to support multiple loans of different seniority and amortisation. With the rise of property derivatives it is increasingly likely that derivatives will eventually become embedded within deals to improve their stability. Such financial innovation may drive the competitive nature of the CRE market, but can make it difficult to obtain a clear picture of the risks involved in a portfolio of such complex assets.

One of the major difficulties faced by portfolio managers in assessing risk is the lack of historical default data. The number of defaults experienced by financial institutions in the last decade is very low. Firms that have defaults have typically not kept detailed information about the leases and loan structures and therefore are unable to correlate the default experience with the characteristics that differentiate good and bad deals. Even banks with complete records do not, by definition, have long term default data on deals incorporating the most recent innovative structures. Given the complexity of CRE deals, most institutions use spreadsheet cashflow models to project the outcome in nominal and stressed conditions, and these stresses can provide useful insights into the nature of the portfolio. However, the spreadsheets are typically tailored to each deal and the data is scattered across the institution on individual desktops, making it a time consuming job to build a consolidated view of the portfolio, and virtually impossible to obtain a consolidated view of the direct exposure to an individual tenant across multiple deals. Furthermore, these spreadsheets are not linked to the banking systems or regularly updated, except possibly at annual reviews.

Rather than looking at the original cashflow models, the portfolio manager could try to draw data from the bank's systems. Typically, loan data will be in the general ledger, interest rate hedges will be in a treasury system, the tenancy data will be in a spreadsheet or Access database and the covenant information located in paper files. Under

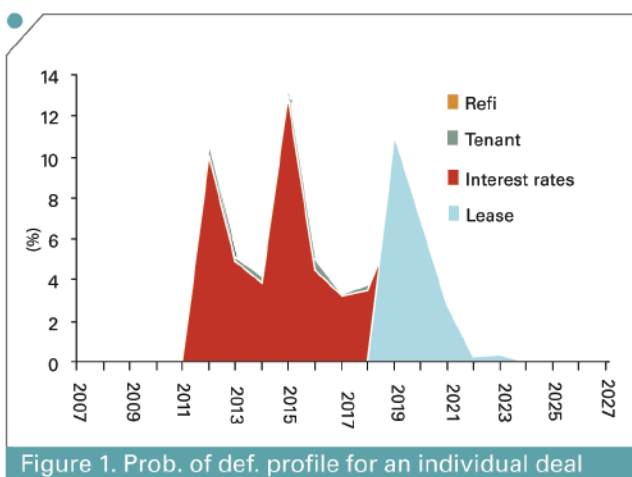


Figure 1. Prob. of def. profile for an individual deal

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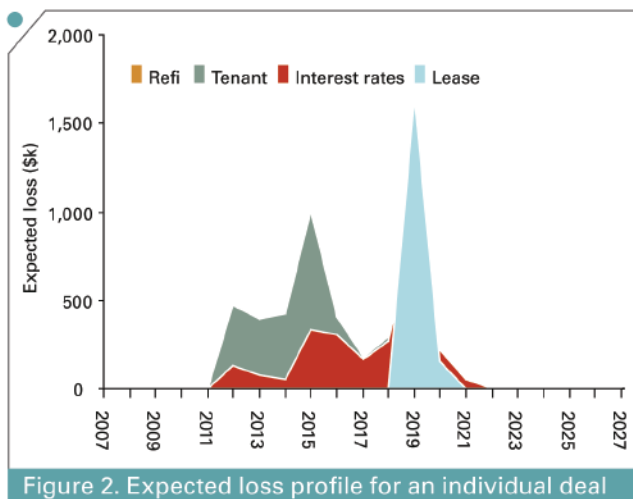


Figure 2. Expected loss profile for an individual deal

such circumstances it is impossible for a manager to answer the question: “If interest rates rise 2% and reletting rents fall by 10%, which deals do we need to be concerned about?” let alone a subtler question such as what will happen to mezzanine loans or equity participations if conditions change. For these assets the payouts are rarely predefined. The payouts depend on how income evolves over time, and on the detailed debt cascade of all the debt and reserve payments that come before the payments to the junior investors. Overall, managers face two challenges: pulling together all the information that can be known about the assets and creating a risk methodology that uses that information to produce useful, actionable results.

Assessing risk

Until recently, many investment banks used the value-at-risk framework to evaluate CRE assets. The VAR framework assumes that the assets can be liquidly traded and then looks at the volatility of the trading price. This seemed a reasonable approach given the amount of trading in commercial mortgage backed securities (CMBS) and was even extended for use on assets that were still on balance sheet awaiting incorporation into a CMBS.

The VAR approach has the advantage of being relatively easy to implement, using up-to-the-minute market data and assessing relatively low regulatory capital against the portfolio. The reason for the low capital is two-fold. Firstly, VAR assumes that the instruments are liquid so if a significant loss starts to occur the bank can sell the position and limit the loss. Secondly, VAR assumes that changes in value from day to day are uncorrelated, and therefore considers it very unlikely that a year-long deep decline in value will occur. In the second half of 2007 these assumptions broke down as credit risk took over from market risk. Citibank was one of the few to acknowledge the problem, saying in the *New York Times*: “We had a market-risk lens looking at those products... when it in fact was a credit event.” As banks have found themselves with loans on their balance sheets that were previously destined to go into a CMBS, they have moved away from the VAR framework for CRE assets.

For a long time the scorecard has been the standard risk-rating tool

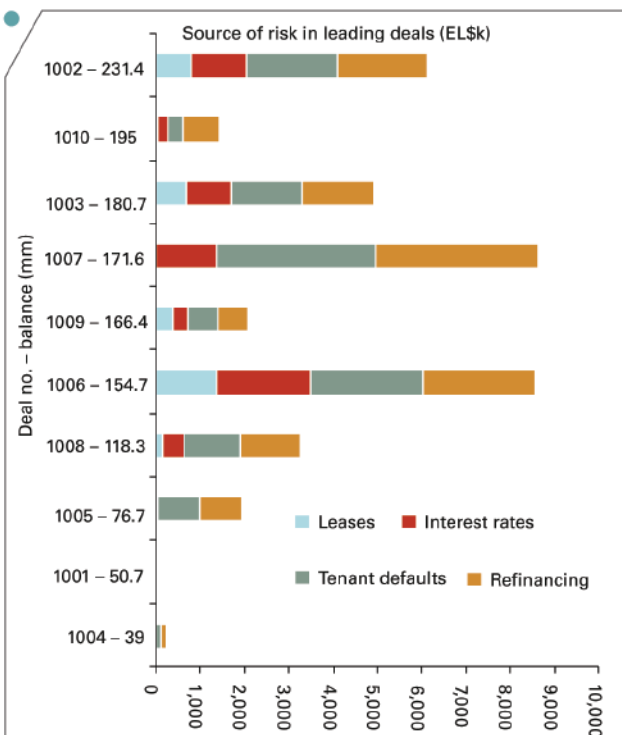


Figure 3. Overview of sources of portfolio risk

used by commercial banks. A typical scorecard takes one or two-dozen factors about the deal and weights them to produce a score, which is then translated into a probability of default. Scorecards work best for assets where there is a large database of historical defaults, for example, credit cards or standard retail mortgages. They work less well if the asset structure is complex or the products are new, such as sub-prime assets or commercial real estate. For these assets historical data is scarce and it is difficult to adequately capture the complexity of the deal in a scorecard. For example, a scorecard would have great difficulty in assessing the difference in risk if the deal had an interest rate cap at 6% versus 5%. In addition to the difficulty of building scorecards, they have two clear limitations: they do not give any information about the correlation in potential losses between one deal and the next, and more importantly, they rarely tell you anything that you don't already know. Scorecards are useful in structuring discussions around risk and pinning down a range for a risk number, but lenders do not use scorecards to guide them when structuring deals. They consider scorecards to be an administrative burden that needs to be undertaken to satisfy senior management, but will not essentially add to their knowledge of the transaction. When CRE lenders want to get better insights into risk, they use cashflow models.

Standard cashflow models for investment deals project rental income, operating costs and debt repayments. For development deals they project construction costs and sales or lease-ups. Lenders then stress their assumptions about rental values, costs, occupancy rates and interest costs to ensure that the deal will survive under a reasonable range of circumstances. If they are unsatisfied with the risk

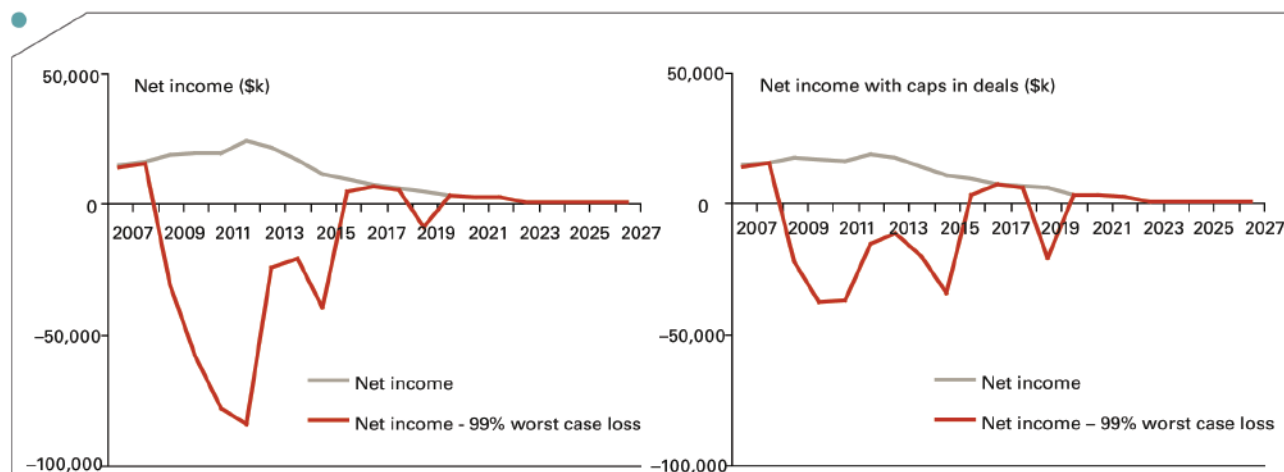


Figure 4. Protection of net portfolio income using caps

they may add features such as reserve accounts or covenants to accelerate debt payments if income falls. Lenders have become adept at using cashflow models to inform their intuition. The main problem with normal cashflow models, from a risk measurement point of view, is that there is no probability associated with the stresses and therefore it is not possible to acquire statistics such as the probability of default, loss-given default (LGD) and risk-adjusted profitability. However, these statistics can be obtained by simulating the cashflows under thousands of possible market scenarios.

From the user's point of view, cashflow simulation is an intuitive extension of the what-if analyses they are used to running. The difference is that the stresses, rather than being stylised and derived from the lender's intuition, are generated based on the distribution of historical market conditions over several decades. Mathematically, simulation is numerical integration of the probability function. Simulation has the attractive quality of enabling the use of all known information: historical market behaviour, forecasts, deal structure, tenant quality and even management behaviour. Historical data on CRE defaults does not enter in to the simulation directly, but can be used to check the calibration and assumptions. Simulation is also applicable at both the deal level and the portfolio level, including assets grouped into CMBS and real estate investment trusts. The main problem with cashflow simulation, however, is the complexity of the model. Models that are not well calibrated often give results that say that deals have a 100% probability of default or a 0% probability. Implementing the models in a secure enterprise system that can run the whole portfolio efficiently also presents a challenge. However, with the right system, these challenges can be overcome.

Portfolio management

The graphs in figures 1 and 2 show a typical result of using simulation to assess a CRE deal. Figure 1 shows the probability of default over time. Note the distinctive profile of the spikes. For this deal the spikes occur in the years of the interest rate going from fixed to floating, a change in amortisation and in the year of a lease expiration. The graph

also breaks out the source of the risk from lease effects, interest rate movements, tenant defaults or failure to refinance at maturity. Figure 2 shows the expected loss from the same deal. Note that although interest rate movements are a significant cause of default risk, they generally lead to zero LGD for this deal, whereas the few tenant defaults lead to significant loss. Knowing this, a lender could sell some caps to the customer to reduce the interest rate risk, and ask for a reserve to be built up to protect against tenant default. The borrower, in return for agreeing to the restructuring, could be rewarded with a reduction in margin equal to the reduction in the expected loss – as estimated by the risk measurement tools. Given the operational and legal costs associated with foreclosing on a property in a distressed market, restructuring the deal to reduce the risk is not a zero sum game: both the bank and the borrower can benefit.

Looking across the portfolio as a whole, risk measurement can be used to guide the portfolio manager's focus. Figure 3 shows a breakdown of the risk for a set of 10 deals. Clearly, deals 1002, 1006 and 1007 deserve immediate attention, with emphasis on the tenant and refinancing risk.

Finally, figure 4 shows how analytics can be used to guide policy across the portfolio. In this case the 99 percentile worst-case loss in net income would greatly improve if all deals in the portfolio had interest rate caps to reduce the number of deals that could default when interest rates rise. This information could drive a general policy of adding caps to deals if the analysis for the deal shows that the reduction in risk will pay for the cap.

CRE is a different business from retail lending and requires specialised risk management tools. If used properly these tools can guide the institution and give new insights into how the portfolio can be restructured to protect it against the possibility of a downturn. This both helps the institution to remain competitive, and can potentially reduce the number of distressed properties in the market. ●