



March 6, 2013

Beyond Regulation: Using Risk Measurement in Profitably Growing the Commercial Mortgage Business

For almost a decade, with the incentives of Basel II and subsequently the demands of stress testing, financial institutions have been focused on implementing risk models to satisfy regulators. These regulatory requirements are too often seen as just an administrative cost and a minimum requirement to stay in business. However, in paying this cost, financial institutions have given themselves a set of tools that can also be used to make more reliable profits.

The disruption to the financial markets created senior managers who are extremely wary of allowing new lending, and who are not as trustful of the old way of doing things, especially the reliance upon guarantors and relationships. At the same time, the disruption has created massive opportunities to make profitable loans to customers who cannot source financing elsewhere. This gap can be profitably bridged with advanced risk measurement and reporting.

In many areas of finance, such as options trading or credit card issuance, good quantitative risk measurement is a fundamental competitive advantage. Closer to home, CMBS traders are using sophisticated models to explore the likely behavior of portfolios of conduit commercial real estate loans. Such quantitative sophistication has rarely been used for commercial real estate lending, but this paper discusses the ways in which risk measurement can both protect and arm financial institutions to exploit the profitable opportunities in CRE whilst controlling the possibility of losses.

Controlling the Portfolio

To allow lenders to pursue profitable opportunities, the institutions' senior managers must be confident that the lending activity will not cause catastrophic losses. Senior management therefore requires the business units to demonstrate that they are well-controlled. They also require information so that they themselves can be comfortable with the risks being undertaken and communicate the soundness of the strategy to external agencies, regulators and investors.

To be confident that the lending will not cause catastrophic losses, the central management group needs to have access to detailed information and multiple perspectives for looking at the risks. Each perspective has pros and cons, so senior management should use as many of them as possible to ensure that the portfolio is still within the limits of the institution's risk tolerance. Portfolio risk reports should include the following six perspectives:

1. Traditional static, non-statistical, views. These reports typically include graphs such as charts of loan-to-value and exposure per sector and geography. Other typical static views include profiles of remaining maturity, projections of financial ratios at refinancing, or charts focused on the largest twenty exposures. These views do not directly estimate the risk, but they do strongly inform the intuition of the business heads. Although the metrics are simple in concept, to be useful they need to be supported by accurate, timely and complete data. In an integrated risk measurement system this raw data is already centrally captured for loan underwriting and reviews and therefore gives a timely and accurate view of the portfolio.

2. Projections of loss for individual loans. The primary results show the average (expected) loss projection per year for each loan, for the portfolio as a whole, and for the largest twenty exposures. In addition to expected loss, it is useful to look at the unexpected loss and maximum probable loss per year because these metrics show the assets that are unlikely to fail, but would cause important losses if they were to fail. Another way to look at loss projections is to chart the net present value of loss for each asset, because the NPV highlights any long-term assets that have insufficient amortization.
3. Loss probability distributions for the portfolio. These loss projections include estimates of the correlation in losses between the loans. The one-year loss distribution is commonly used to estimate the required economic capital, i.e., the amount of capital that is required to cover a very unlikely one-year loss, e.g., a loss with only 0.05% chance of happening. However, one-year capital is not very useful for long-term assets like commercial mortgages. Furthermore, one-year capital is largely theoretical because it is very difficult for people to imagine and estimate events with such small probabilities. For these reasons, in commercial real estate especially, it is important to also look at the multi-year loss distributions. When compared with available capital, multi-year loss distributions are more imaginable and therefore more actionable. For example over one year there might be a 0.05% probability of losses exceeding current capital, but over two or three years that probability rises to levels like 2% to 8% because of the serial-correlation in losses. More simply put, it is almost unimaginable that losses in one year could exceed the institution's capital, but it is quite likely that the losses in the first year of a crisis could be so large that the institution cannot withstand the second year of crisis. To ensure that the institution continues to be an ongoing concern through a multi-year crisis, it should consider the multi-year loss projections.
4. Regulatory (Basel) capital. Of course the institution needs to know how much capital it should hold to satisfy the regulatory capital requirements, but regulatory capital is also useful because it gives an alternative view of the risk. The Basel formulae are relatively simple and make standardized assumptions for factors such as the correlation between loan defaults. In aggregate the Basel capital should come out to be similar to the equivalent economic capital calculated by the institution. If there is a significant difference, it should be carefully reconciled.
5. Stress-tests. Loss projections for a "what-if" stress scenario are understandable to a wider audience than probability distributions and in many ways more useful than economic capital. The main disadvantage of stress testing is that if management tailors the portfolio only to survive a particular stress event, it may not survive an event of a different nature. For example, if the stress test only had interest rates hikes, the portfolio would look safer if all new loans were originated as fixed-rate loans, but such a portfolio could suffer large losses if interest rates and inflation were low. The disadvantages of stress testing can be reduced by testing several different scenarios and also by supplementing stress testing with the other metrics.
6. A breakdown of the losses according to the sources of risks. Obviously the reports should highlight the individual loans, geographies and sectors contributing the greatest risk, but they should also quantify the relative significance of risk factors such as interest rate movements, lease roll-overs, tenant defaults and refinancing. For example, if it is found that the portfolio as a whole is *systemically* exposed to interest rate risk, management can then take action by introducing a policy of adding swaps into individual deals to reduce their individual credit risk, or to add interest rate derivatives to hedge the portfolio as a whole.

Almost all of these risk forecasts depend on projections of the real estate market as a whole. With cashflow models the forecasts are explicit, whereas the forecasts are implicitly embedded in scorecards and regressions. Given the significant influence of the explicit or implied market forecasts, the risk projections should also be supplemented by results using different market assumptions. For example, what happens if the market continues moving as-is, or stays flat, or reverts to the long-term

average? These are not stresses but alternative reasonable assumptions for the likely path of the market. If these assumptions give very different results, the institution needs to carefully examine the forecasts it is using for the medium-term future of the market.

With several diverse views of the risks, central management can have comfort that the commercial real estate lending operation will not cause major problems for the institution. Having established that the risk of the portfolio as a whole is under control, the next step is to focus on giving the business unit the best environment and tools to make profits.

Aligning Incentives

People are naturally influenced by the environment or “game” in which they are set. A person who is paid according to the volume of loans they originate, without regard to risk, will naturally promote and originate a large volume of risky loans.

Maximizing risk-adjusted profits for the institution requires that the lenders are in a game in which their personal incentives are closely aligned with the interests of the institution. Compensating according to the volume of loans originated negatively aligns the lender’s financial incentives against risk control because it is easiest to make large volumes by lending to risky clients. Such volume incentives for the lenders also require strong adversarial gate-guardians in the credit approvals committee to stop the most risky loans.

The ultimate alignment of incentives would be to give no wage, but a share of each piece of margin income received by the institution and reverse compensation from the lender to the institution for any write-offs. Only the boldest of lenders would agree to such an extreme alignment, especially given the long-term nature of commercial real estate loans. In most cases it is more practical to link compensation to a mixture of projected risk-adjusted profitability and actual outcomes. The projected profit can be given by risk models, but these models need to be managed differently depending on the incentive structure.

Profitability Models

In situations where compensation is linked strongly to the *projected* risk-adjusted profitability rather than linked to *actual* outcomes, the risk models must be centrally controlled so that a lender has no opportunity to, consciously or subconsciously, change the models to minimize the projected risks. In these situations it is also important that the models are comprehensive. They should include every factor that is significant in determining the risk of a given deal. To the extent that a risk factor is missing from a model, there will be an adverse incentive to originate loans containing that “unseen” risk, and then the institution must rely more heavily on the credit approvals committee to stop any misuse of the models to understate risk and thereby overstate risk-adjusted profitability.

In situations where compensation is more closely aligned with actual outcomes, the institution has less need to centrally control the use of the models because the lenders themselves will have a strong personal incentive to only originate loans with fundamentally good risk return characteristics. To see how this works in practice, consider trading operations. In trading operations profits and losses are quickly realized and compensation is linked very closely to actual outcomes. This gives the traders strong incentives to understand the actual risk-adjusted profitability. To best understand the risks, and to beat the competition, traders have their own proprietary risk pricing models which they manipulate as they see fit to best mirror their understanding of the risks and opportunities. In this situation the risk model results only matter to the extent that they guide the trader to make choices that lead to a profitable outcome. Separate from these “personal” risk pricing models, central risk management typically has a set of standardized models which they use in the value at risk calculations to monitor the overall risk of the portfolio.

For commercial real estate, if the lenders’ incentives were reasonably aligned with the actual loan performance, they would have a deep personal interest in understanding and structuring the risks. In that situation they should be provided with the most advanced tools available to complement their

market expertise and to get the edge over the competition. If we look at traders and credit card issuers, we see an arms-race in which businesses use refined sophisticated models to cherry-pick their transactions and guide new deal structures. In commercial real estate, common choices for the financial structure are about the amortization pattern, reserves, swaps, sweeps and covenants. More exotic structures can include swaps beyond the life of the loan to reduce refinancing risk, and embedding commercial real estate derivatives within a deal to alter its default risk.

Currently in commercial real estate lending, the models for risk and pricing tend to be quite basic. For example, many lenders use a static projection of cashflows and a scorecard. The main reason for this is that commercial real estate deals are complex, with many interactions between risk factors such as the interaction between, lease-length, lease-level relative to market, tenant credit-quality and the extent to which the loan is floating rate. It has been said that it is impossible to build models to quantify the risk of commercial real estate lending. That is incorrect. Although it is challenging, it is quite possible to capture these interactions, and the trend of using models to guide structures and price transactions is now moving into commercial real estate lending. For a model to provide a competitive advantage it must show how the risk changes as details of the financing structure changes, e.g., the effect of adding a sinking fund or a sweep trigger. It must also allow the user to enter their proprietary views on market forecasts and how the market works, just as traders use model to quantify the consequence of their market views for their planned deals. The only models that can capture this level of useful detail are cashflow simulation models. Cashflow simulation can show both the risk of traditional deal structures, and the risk of structures that are new to the market.

With good comprehensive models supporting their expert judgment, lenders can more confidently conduct imaginative deals that significantly minimize the risk whilst slightly undercutting the pricing of less sophisticated competitors. Good models allow lenders, like traders, to enter their views on the market and the nature of the real estate, and then design the best financing structure to maximize risk-adjusted profits.

Finally, with the institution satisfied that the worst case is manageable, with the lender's compensation aligned with the institution's interests, and with the lender fully armed with models to understand the risks and devise new financing structures, the stage is set to free the lenders to do what they do best: pursue profitable real estate lending.

Conclusion

Over the last decade risk models have often been thought of as an externally imposed burden. This regulatory pressure has had the advantage of spurring the development of improved risk models, but few institutions have exploited the power of the models to make more reliable profits. Once a system is properly in place for regulatory reporting, ninety percent of the technical work has been done. With only a fraction more effort commercial real estate lenders can use the tools as a competitive advantage. Historically, this maturation has occurred in other asset classes but for CRE the complexity has made it daunting. Today, CRE is one of the last frontiers—thirty years ago, models were first used for options trading, twenty years ago they were used for credit card origination, ten years ago they became common for middle-market corporate lending and now quantitative risk measurement is becoming the norm for those who make profits in commercial real estate lending.

Chris Marrison, CEO, Risk Integrated

Tel: +1 (845) 598-1620

Chris.Marrison@RiskIntegrated.com