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# Construction Lending

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**W**hen property markets begin to falter, the first loans to come under scrutiny are retail housing followed quickly by lending for new commercial construction. Construction is particularly vulnerable because there are many months between commitment and completion. The main concern is the chance that, in the intervening time, the demand for new property will fall, depressing the ultimate sales price or the ability to rent out the new space. There is also the fear of cost over-runs and of bankruptcy of the construction firm or equity sponsors, especially when either is stretched over multiple, struggling projects.

With the right information, a bank can quickly identify problem projects it has lent to. It can then take action, for example, by preventing further construction on new phases of a

development project or by establishing covenants that trigger accelerated repayments. It can also play hardball, refusing further funding until the property owner drops the asking price to sell the units more quickly. Although this action removes some of the risk for the bank, it also limits the owner's possible profits. A bank must be sure not to over-react because it could unnecessarily damage trust that has taken years to build.

However, if the lender is careful, it can also use a general market downturn to be choosy. It can cherry-pick the funding of new high-quality projects at a time when other banks are stepping back. To enjoy these advantages the bank must have a clear, detailed view across its existing CRE portfolio and it needs the ability to analyze the fundamentals of individual assets it may wish to add. This serves to direct

structuring and re-structuring of the portfolio. However, there are two big hurdles to overcome: 1) how to quantify the risk in individual loans to guide structuring, pricing, and capital allocation, and 2) how to set up an efficient, ongoing process to monitor the CRE portfolio containing construction loans.

### Applying Cashflow Simulation

CRE assets are complex. There is always the need to assess numerous conditions several months or years into the future. The most reliable method for quantifying the risk in CRE construction lending is cashflow simulation. With simulation, thousands of possible outcomes for the future are tested around a central forecast. Cashflow simulation is conceptually straightforward as a quantitative method for combining different, possible interactions of large-project risks. It generates thousands of potential outcomes for factors such as construction costs, construction time, sales values, sales times, interest rates and counterparty defaults. The outcomes then flow into a cashflow model representing the project

and the loan repayment profile is calculated for each individual scenario. From these results, standard metrics such as the probability of default can be generated.

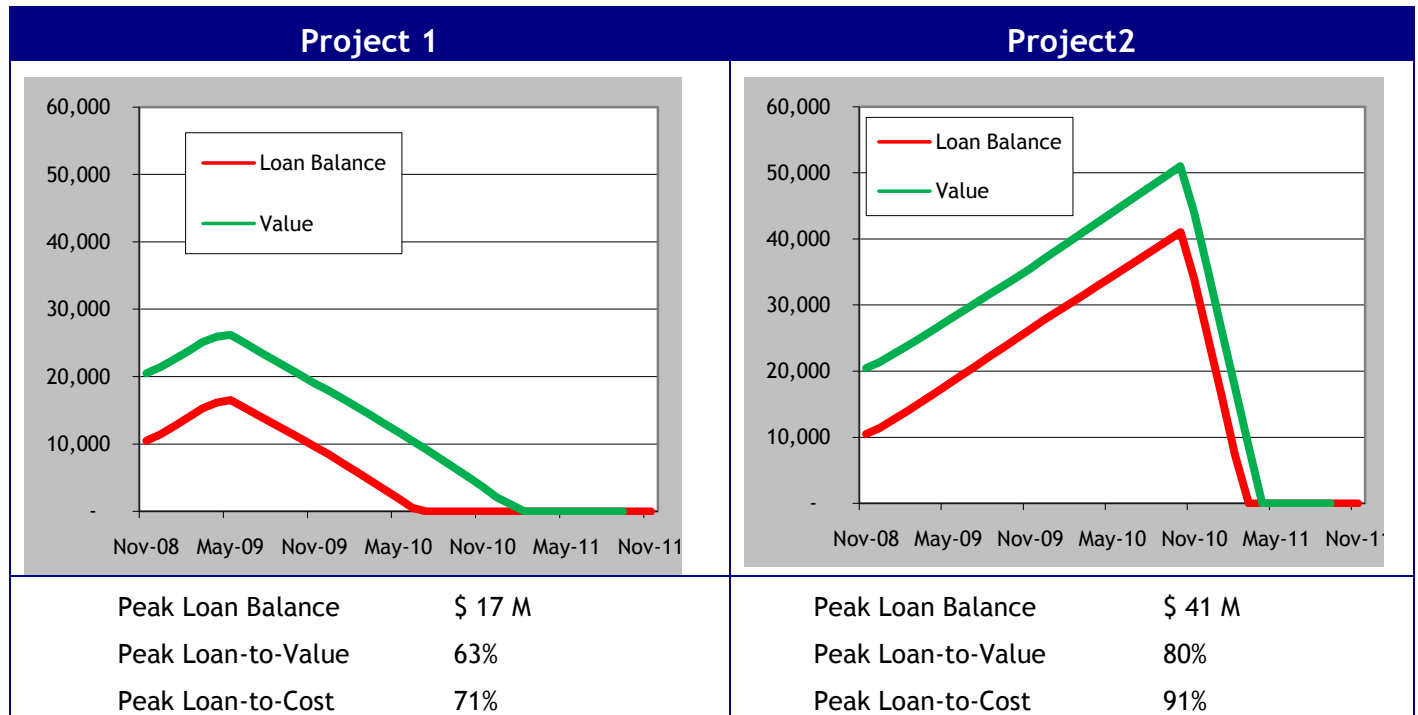
Proper parameterization is a key factor in this analysis. It ensures that the full spread of possible outcomes is represented and that all the factors are properly correlated. To see the importance of correlation, consider the linkage between falls in property values and delays in sales times. If the analysis were not to link these events, the shortfall of income from a fall in property values could be offset by early sales and the risk can be significantly undercounted in many scenarios.

As an example of quantifying the risk by using cashflow simulation, consider the two projects shown in Table 1, with identical properties and costs but different construction profiles. The projections of expected balance and value in the nominal base-case are shown in Table 2 below.

**Table 1: Description of Example Projects**

Project 1		Project 2	
Number of houses:	100	Number of houses:	100
Value of each house:	\$ 500,000	Value of each house:	\$ 500,000
Cost of land:	\$ 15 M	Cost of land:	\$ 15 M
Equity contribution:	\$ 5 M for land	Equity contribution:	\$ 5 M for land
Expected construction cost:	\$ 30 M	Expected construction cost:	\$ 30 M
Construction profile:	5 houses started per month, each completed in 6 months	Construction profile:	100 houses started at the same time, 24 months to completion
Sales:	Within 3 months of each completion	Sales:	Within 6 months of completion

**Table 2: Loan Balance and Property Values in the Nominal Forecast Case**



From the nominal results above, Project 1 appears to have much lower risk because of the lower loan balance throughout the construction phase. The Loan-to-Value and Loan-to-Cost also remain lower. However, Project 1 is effectively highly leveraged in that a small cost over-run or fall in value very quickly degrades the ratios.

The risk results from running one thousand different scenarios on each project are shown

in Table 3. Here, Project 2 does indeed have a slightly higher risk in terms of probability of default and expected loss, however, the loss given default shows that if Project 1 does fail, the loss will be much greater as a percentage of the balance. This is reflected in the difference in the credit margin, with Project 1 requiring an additional 110 basis points.

**Table 3: Statistical Risk Results**

Project 1		Project 2	
Probability of Default	8.0%	Probability of Default	10.0%
Average Balance	\$ 10.1 M	Average Balance	\$ 24.9 M
Loss Given Default	31%	Loss Given Default	14%
Credit Margin	2.5%	Credit Margin	1.4%

## Managing Portfolios

Now let us turn from the assessment of individual projects to the effective management of portfolios of thousands of projects. Achieving the portfolio-view presents three related difficulties: data collection, data standardization and a good standard cashflow model. Starting with the cashflow model, the challenge is to implement a model that will cope with all the complexity and diversity that occurs within and between different construction projects.

### Powerful but Simple Cashflow Model

The cashflow model must be formulated to encompass the many variations in construction projects such as construction schedules, release prices, pre-sales, deposits, late penalties and completion guarantees. It needs to cover projects across their whole lifecycle from greenfield to practical completion, taking into consideration the stage of the project when some units may be are rented out, sold, or still under construction.

For portfolio monitoring, the model must also have outputs and risk metrics that are compatible with other types of assets in the portfolio such as loans to stabilized investment properties or equity investments. To perform risk analysis, it must stretch across the space of all possible contingencies such as contractor defaults, presales default or construction time over-runs. And yet, despite covering such a wide range of circumstances, for the model to be usable, it must be as simple as possible and it should use a small number of standardized inputs so that information can be easily collected on all the loans in the portfolio. This

requires a carefully designed input data structure as the model is being built.

### Efficient Workflow and Report Generation

Once the model and data structure are established, there must be a system in place at the bank for centrally capturing all the latest deal information so that a picture can be formed of the portfolio as a whole. The system must be set up to be integrated into the lending teams' workflows so that by entering data that is useful for portfolio analysis, the lending teams also get automatic reports that reduce their workload elsewhere.

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The main types of reports to be generated for lending teams are automatic credit committee applications, automatic loan review documents,

and stress tests. Currently, it is common that stress tests are set centrally, then distributed to all lending teams with the request for them to *estimate* what the results of the stress would be for their assets. Although necessary for portfolio monitoring and reporting, it is a laborious process for the lending teams. By automatically running the stress tests centrally, not only are the stress results more timely and reliable, but they also let the lending teams to get back to their core competencies of generating new business and managing existing assets.

### Conclusion

Until recently lenders have relied on their intuition and a scatter of spreadsheets. However, to survive and prosper in a difficult market, banks need a rigorous approach for quantifying the risk and a standard approach to assess risk across the portfolio.