Executive Summary

How to Analyse Risk in Securitisation Portfolios:
A Case Study of European SME-loan-backed deals[1]

Reliable risk management requires an approach that allows for non-linearity by modelling tranche returns in a 'look through' manner. This involves modelling risk in the underlying loan pool and then tracing through the implications for the value of the securitisation tranches that sit on top.

Returns on securitisation tranches depend on the performance of the pool of assets against which the tranches are secured. The non-linear nature of the dependence can create the appearance of regime changes in securitisation return distributions as tranches move more or less "into the money".

This note describes a rigorous method for calculating risk in securitisation portfolios using such a look through approach. Pool performance is simulated using Monte Carlo techniques. Cash payments are channelled to different tranches based on equations describing the cash flow waterfall. Tranches are re-priced using statistical pricing functions calibrated through a prior Monte Carlo exercise.

The approach is implemented within *Risk Controller™*, a multi-asset-class portfolio model. The framework permits the user to analyse risk return trade-offs and generate portfolio-level risk measures (such as Value at Risk (VaR), Expected Shortfall (ES), portfolio volatility and Sharpe ratios),and exposure-level measures (including marginal VaR, marginal ES and position-specific volatilities and Sharpe ratios).

We implement the approach for a portfolio of Spanish and Portuguese SME exposures. Before the crisis, SME securitisations comprised the second most important sector of the European market (second only to residential mortgage backed securitisations). In the current low interest environment, SME securitisations offer attractive returns. But, for investors to be confident in developing a portfolio of SME securitisations, fully satisfactory approaches to measuring and managing risk must be implemented.

Our portfolio of Spanish and Portuguese SME exposures has a 99.9% VaR of 8.20%, close to the traditional Basel I capital ratio of 8% (which is often associated with high BB-rated

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[1] This note was prepared by Jozsef Kutas and William Perraudin.

loans). We show how the tranche-level Marginal VaRs implied by our approach are strongly positively correlated with a low attachment point, a high Weighted Average Life (WAL) and low rating grades.

To benchmark the capital measures supplied by our Monte Carlo model, we also calculate MVaRs using a simple, stylised capital model, the Arbitrage Free Approach (AFA), introduced by Duponcheele, Perraudin and Totouom-Tangho (2013). We show that the numerical Monte Carlo model MVaRs and those implied by the AFA are closely correlated. (A regression of the numerical MVaRs on the AFA MVaRs yields an R-squared of 88 %.)

As another benchmarking exercise, we calculate the MVaRs implied by the SEC-IRBA and SEC-SA regulatory capital charges specified in BCBS (2014). Again, we show they are correlated with the numerical Monte Carlo MVaRs. (A regression of numerical MVaRs on SEC-IRBA and SEC-SA MVaRs yields an R^2 of 87 %.)[2]

Taken together, the numerical and theoretical models implemented in this note provide a convincing analysis of the risk involved in holding a portfolio of securitisation tranches. As such, they permit investors to profit from the relatively high returns offered by securitisation portfolios while maintaining a cautious and prudent approach to risk.

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[2] While the analytical models yield MVaRs closely correlated with the numerical MVaRs for a specialised portfolio consisting of tranches in a single market (in this case, SME-backed deals in Spain and Portugal), note that they are not capable of robust generalisation to a multi-factor portfolio that includes tranches from different geographical regions and pools comprising other loan types. Also, within a narrower range of credit quality (for example tranches in our sample with MVaRs below the median), the correlation is lower.