

## **Loss estimation for retail credit using Monte Carlo simulation**

Monte Carlo simulation has been used successfully in many areas of Finance for estimation and forecasting values where there is a complex relationship between underlying variables. For example, Monte Carlo has been used in investment portfolio evaluation and in Corporate Finance for project evaluation. In this study, we use Monte Carlo simulation to estimate future Loss which is computed as the product of Loss-given-default (LGD) and Exposure-at-default (EAD) given a default event. Both LGD and EAD are random variables and default is a random event and these three terms exhibit dependencies which will affect Loss estimation. Based on separate models for default, LGD and EAD, Monte Carlo simulation is used to accurately estimate losses at account and portfolio level. Such estimates can include Expected Loss, Value-at-Risk and Expected Shortfall. The variance in the Loss estimate will be a function of uncertainty in the underlying models, hence this approach can also serve as a way to assess model performance. By including macroeconomic variables in the models and simulating from a distribution of possible future economic scenarios, this approach also allows Loss estimation to take economic conditions into account. In this presentation, we give results applying this method to simulated data, as well as real credit card and mortgage portfolios.