

ICTS Colloquium

- Title** : Portfolio Credit Risk: Simple Closed Form Approximate Maximum Likelihood Estimator and Related Issues
- Speaker** : Sandeep Juneja, Tata Institute of Fundamental Research, Mumbai
- Date** : Monday, September 4, 2017
- Time** : 3:00 PM
- Venue** : Madhava Lecture Hall, ICTS Campus, Bangalore
- Abstract** : Measuring portfolio credit risk is an important problem faced by lending financial institutions. Controlling such a risk is also important for the overall economy. In this talk we overview and address mathematical modelling issues involved in this effort – popular modelling regimes, analysis of tail risk, fast simulation algorithms. We focus on popular models where estimation of parameters using maximum likelihood (ML) methods can be computationally cumbersome, particularly since defaults are rare and a large amount of data is needed for this estimation. We observe that since the defaults are typically rare (say, on average 1% annually), ML estimation suggests an approximate simple, accurate and intuitively appealing *closed form estimator* of the underlying parameters. To gain comparative insights, we analyze the properties of the proposed as well as the ML estimator in a statistical asymptotic regime where the conditional probabilities decrease to zero. We conclude that when the underlying model is correctly specified, the proposed estimator is almost negligibly worse than the ML estimator. Importantly however, since typically any model is mis-specified, then both the proposed and the ML estimator are *equally good or equally bad!* We also conduct large deviations analysis and suggest fast simulation algorithms for a general class of dynamic portfolio credit risk models.