PROGRAMME: BMI-DST-ABSA DIRECTED RISK RESEARCH WORKSHOP

DST Auditorium, DST Building (Building 53), CSIR Campus, Pretoria
2 June 2016

Timeslot	Topic	Speaker
Thursday 2 June – Session 1	**Setting the scene: Requirement for Industry-Aligned Risk Research** **Session Chair: Prof Phillip Mashele**	
08:00-08:55	Morning Coffee, Registration and Networking	
09:00-09:35	Opening Address - The state of high end skills utilisation in the country	Dr Phethiwe Matutu, Chief Director: Human Capital and Science Promotion, DST
09:35-10:10	The requirement for high end risk skills in financial services	Mrs Ina de Vry, Managing Principal: Model Risk and Development, Barclays Africa
10:10-10:40	Tea & Networking	
10:40-11:20	Overview of DST funding for strengthening basic risk research capabilities	Dr Neels Erasmus, BMI
11:20-12:00	Open discussion: Key factors in building an industry-aligned research programme	All
12:00-13:00	Lunch & Networking	
Thursday 2 June – Session 2	**Current Technology-Pull Research Projects** **Session Chair: Dr Freek van der Walt**	
13:00-13:35	Research in Predictive Modelling - Binning, Variable Selection, Income Modelling	Prof Tanja Verster, BMI
13:35-14:10	Quantile approximation in operational risk loss distributions	Prof Helgard Raubenheimer, BMI
14:10-14:45	Pricing of Share-based Lending and Black-Economic-Empowerment Deals	Prof Tom McWalters, UCT
14:45-15:10	Tea & Networking	
15:10-15:45	Embedded derivatives and other financial weapons of mass destruction	Prof Eben Mare, UP
15:45-16:00	UP Feedback on utilisation of DST funding	Dr Conrad Beyers, UP
16:00-16:15	UCT Feedback on utilisation of DST funding	Prof Thomas McWalters, UCT
16:15-16:30	UNISA Feedback on utilisation of DST funding	Prof Jackie Young, UNISA
16:30-17:00	NWU Feedback on utilisation of DST funding	Prof Phillip Mashele, BMI
17:00-18:30	Cocktail and networking	

Abstracts:

Research in Predictive Modelling - Binning, Variable Selection, Income Modelling

Prof Tanja Verster

Predictive modelling is the process used in predictive analytics to create a statistical model of future behavior and are widely used as analytical tools in retail credit. Binning, variable selection and income modelling form part of the predictive modelling process. We propose a new technique of automatically binning explanatory variables as well as a new technique for selecting variables. We will compare the new binning technique and the new variable selection technique with current existing techniques on a real world dataset. Different method to model income will also shortly be discussed.

Embedded derivatives and other financial weapons of mass destruction

Prof Eben Mare

We consider pricing and hedging of so-called embedded derivatives in a South African context. We highlight some concerns in the normal approach to management of these instruments and provide details of research activities aimed at understanding the use (and abuse) of those products.

Pricing of Share-based Lending and Black-Economic-Empowerment Deals

Prof Tom McWalters

In this talk a brief introduction to the pricing of share-based lending and BEE deals is given. Due to the optionality inherent in the pay-off profile, fair value must be determined using derivative pricing methods. It is well known that the path dependency of these derivatives means that the naive use of the Black-Scholes formula leads to incorrect results. This is the reason that these deals should generally be valued using Monte Carlo methods. A closed form approximation for fair value is derived, accounting for the discrete nature and correlation of dividends. Under realistic scenarios, this approximation is demonstrated to produce accurate results when compared to Monte Carlo simulation. Then, hedging of correlation risk is explored --- this could potentially make such option schemes less risky to the institutions funding the deals. Finally, since spot price and dividend values in these deals are often estimated using corporate finance approaches, which inherently assume a real-world measure, compatibility with risk-neutral pricing is discussed.

Quantile approximation in operational risk loss distributions

Prof Helgard Raubenheimer

A popular method in modelling the aggregate loss distribution in risk and insurance is the Loss Distribution Approach (LDA). For example many banks currently use the LDA for estimating economic and regulatory capital for operational risk under Basel's Advanced Measurement Approach. The aggregate loss distribution is a compound distribution resulting from a random sum of losses, where the losses are distributed according to some severity distribution and the number (of losses) distributed according to some frequency distribution. This paper studies the approximation of extreme quantiles of the aggregate loss distribution. A key application of this approximation is the estimation of the economic or regulatory capital in a particular operational risk category (ORC). We propose an approach to approximate the extreme quantile of the compound distribution using a combination of a multiplier and the less extremel quantile of the underlying severity distribution. The proposed approximation is assessed via a simulation study.