Aarhus Quant Factory – Symposium
Aarhus Quant Day
17 January 2014
Department of Economics and Business, Aarhus University
Fuglesangs Allé 4, 8210 Aarhus V, Auditorium M2

PROGRAMME

8.00-8.50  Registration and light breakfast
8.50-9.00  Welcome
9.00-9.45  Leif Andersen – Ultra High Performance American Option Pricing
9.45-10.30 Vladimir Piterbarg – Optimal posting of sticky collateral
10.30-11.00 Coffee break
11.00-11.45 Chris Rogers – Estimate nothing
11.45-12.30 Wim Schoutens – Model, calibration and parameter risk – Moment matching calibration
12.30-13.30 Lunch break
13.30-14.15 Jan Kallsen – The effect of small transaction costs on optimal investment, consumption, option pricing, and turnover
14.15-15.00 Brian Huge – How to construct a volatility surface
15.00-15.30 Coffee break
15.30-16.15 Rama Cont – CloseOut Risk Evaluation: a new approach for integrating market and liquidity risk
16.15-17.00 Jesper Andreasen – Quant history
17.00-18.00 Drinks at Klubben
18.30 Symposium Dinner at “Det Glade Vanvid”
LEIF ANDERSEN
Head of Global Quant Group
BANK OF AMERICA MERRIL LYNCH

Ultra High Performance American Option Pricing

Leif B. G. Andersen is the Global Co-Head of The Quantitative Strategies Group at Bank of America Merrill Lynch, and is an adjunct professor and lecturer at NYU’s Courant Institute of Mathematical Sciences and CMU’s Tepper School of Business. He holds MCs in Electrical and Mechanical Engineering from the Technical University of Denmark, an MBA from University of California at Berkeley, and a PhD in Finance from Aarhus Business School. He was the co-recipient of Risk Magazine’s 2001 Quant of the Year Award, and has worked for more than 20 years as a quantitative researcher in the derivatives pricing area. He has authored influential research papers and books in all areas of quantitative finance, and is an Associate Editor of Journal of Computational Finance.

JESPER ANDREASEN
Global Head of Quantitative Research
DANSKE BANK

Quant History

Based on his life as a kwant, Jesper surveys the history of quantitative finance in banks and trading activities. This includes past, present and future modeling challenges, a few anecdotes, and some general advice for education and career development.

Jesper Andreasen heads the Quantitative Research Department at Danske Bank in Copenhagen. Prior to this, Jesper has held positions in the quantitative research departments of Bank of America, Nordea, and General Re Financial Products. Jesper’s research interest include: term structure modeling, volatility smiles, and numerical methods. Jesper holds a PhD in mathematical finance from Aarhus University, Denmark. He received Risk Magazine’s Quant of the Year awards in 2001 and 2012, and is an honorary professor of mathematical finance at Copenhagen University.

RAMA CONT
Professor of Mathematics and Chair in Mathematical Finance
IMPERIAL COLLEGE, LONDON

CloseOut Risk Evaluation: a new approach for integrating market and liquidity risk
Rama CONT is Professor of Mathematics and Chair in Mathematical Finance at Imperial College London. He joined Imperial College in 2012 after holding teaching and research positions at Ecole Polytechnique (France), Columbia University (New York) and Université Pierre & Marie Curie (Paris VI). Rama Cont’s research focuses on stochastic analysis, stochastic processes and mathematical modeling in finance, in particular the modeling of extreme market risks: discontinuities in market behavior, extreme risks, endogenous risk and systemic risk. He has also participated in numerous consulting projects for financial institutions and regulators in the UK, Europe, US and Asia. He has co-authored Financial Modelling with Jump Processes (2003) and is the Editor-in-Chief of a major reference work, the Encyclopedia of Quantitative Finance (Wiley 2010). He was elected Chair of the SIAM Activity Group on Financial Mathematics and Financial Engineering (2010-2012). Prof. Cont was awarded the Louis Bachelier Prize by the French Academy of Sciences in 2010 for his research on mathematical modeling in finance. He holds a Doctorat from Université de Paris Sud (Orsay), a Masters degree in Theoretical Physics from Ecole Normale Supérieure (Paris) and a BSc from Ecole Polytechnique (France).

BRIAN HUGE
Chief Analyst
DANSKE BANK

How to construct a volatility surface

The presentation will give a method to create a continuous volatility surface from discretely observed quotes. The method ensures that there are no arbitrages neither in straddles nor in calendar spreads and at the same time allows for an easy to control extrapolation to the far OTM volatilities. The method is based on short expiry expansions of SABR type models.

Brian works at Danske Bank, where he has worked for more than 10 years. He is working in the Quant group as Chief Analyst with focus on FX and equity derivatives. Brian has a Ph.D. in Mathematical Finance from Copenhagen University. The thesis title is “On defaultable claims and credit derivatives”. In 2012 he was awarded Quant of the year by Risk magazine.

JAN KALLSEN
Professor
CHRISTIAN ALBRECHTS UNIVERSITY, KIEL

The effect of small transaction costs on optimal investment, consumption, option pricing, and turnover

Jan Kallsen is professor at the university of Kiel (Germany) with specialisation in Mathematical Finance. He studied Mathematics and Physics in Kiel and Freiburg. He holds a PhD in Mathematics from Freiburg university. He spent extended research visits at Boston University and Technische Universität Wien. Prior to Kiel he held a position as associate professor at Technische Universität München. His primary research interest are financial mathematics and the theory of stochastic processes.
VLADIMIR PITERBARG  
Global Head of Quantitative Analytics Group  
BARCLAYS

Optimal posting of sticky collateral

The talk will cover the following

- Optimization problems arising from multi-currency CSAs with no or hard-to-enforce substitution rights
- Discrete and continuous-time formulation and simplifications
- Optimal collateral posting strategy via term rates
- HJB equation and numerical schema
- Switch boundary approximations
- Practical applications

Vladimir V. Piterbarg is a Managing Director and the Global Head of Quantitative Analytics at Barclays. Before joining Barclays Capital in March 2005, he was a co-head of quantitative research for Bank of America, where he had worked for 8 years. Vladimir Piterbarg’s main areas of expertise are the modelling of interest rate and hybrid derivatives. He holds a Ph.D. in Mathematics (Stochastic Calculus) from University of Southern California. Vladimir V. Piterbarg won two Risk Magazine’s Quant of the Year Awards (2006 and 2011). He serves as an associate editor of the Journal of Computational Finance and the Journal of Investment Strategies. Together with Leif B.G. Andersen, Vladimir V. Piterbarg is the author of the authoritative, 1,200 page long, three-volume set of books “Interest Rate Modeling”. He also published more than 20 articles in various areas of quantitative finance.

CHRIS ROGERS  
Professor  
UNIVERSITY OF CAMBRIDGE

Estimate Nothing

In the econometrics of financial time series, it is customary to take some parametric model for the data, and then estimate the parameters from historical data. This approach suffers from several problems. Firstly, how is estimation error to be quantified, and then taken into account when making statements about the future behaviour of the observed time series? Secondly, decisions may be taken today committing to future actions over some quite long horizon, as in the trading of derivatives; if the model is re-estimated at some intermediate time, our earlier decisions would need to be revised – but the derivative has already been traded at the earlier price. Thirdly, the exact form of the parametric model to be used is generally taken as given at the outset; other competitor models might possibly work better in some circumstances, but the methodology does not allow them to be factored into the inference. What we propose here is a very simple (Bayesian) alternative approach to inference and action in financial econometrics which deals decisively with all these issues. The key feature is that nothing
Chris Rogers took up the Chair of Statistical Science in September 2002, after almost nine years at the University of Bath, where he was Professor of Probability in the Department of Mathematical Sciences. Before that, he had held teaching positions at Queen Mary & Westfield College (University of London), the University of Cambridge, the University College of Swansea, and the University of Warwick. Chris works in the theory of probability and its applications, particularly in quantitative finance. His work in finance includes the potential approach to the term structure of interest rates, complete models of stochastic volatility, portfolio turnpike theorems, improved binomial pricing, robust hedging, liquidity modelling, axiomatics of valuation operators, the equity premium puzzle, duality in optimal investment/consumption, and Monte Carlo valuation of American options. Chris has served the community as a past or present editor of Finance & Stochastics, Mathematical Finance, Annals of Applied Probability, Stochastic Processes and their Applications, and Stochastics. Additionally, he organised two major international programmes at the Isaac Newton Institute, Financial Mathematics in 1995, and Developments in Quantitative Finance in 2005. Within Cambridge, he is the instigator of Cambridge Finance, and leads the Quantitative Finance Group in the Statistical Laboratory. Together with Professor David Williams, Chris wrote the two volume work 'Diffusions, Markov Processes, and Martingales', originally published by Wileys, Chichester, and now re-released by Cambridge University Press. Chris has participated in several Risk training courses, and has consulted for a number of clients in the financial services industry. He currently acts as an advisor for the Cambridge-based hedge fund Cantab Capital Partners.

WIM SCHOUTENS
Professor in financial engineering
CATHOLIC UNIVERSITY OF LEUVEN

Model, calibration and parameter risk - Moment matching calibration

We discuss several new developments and insights related to the calibration of financial models to a given set of derivative prices. In particular, we focus on the new moment matching technique where the moments of the risk-neutral density function are directly inferred from at-the-money and out-the-money European vanilla option quotes. The calibration of several models can be performed almost instantaneously and rest on closed-form expressions only. We illustrate the general theory with calibration exercises employing the popular Levy models and Heston’s Stochastic Volatility model.

Wim Schoutens (Leuven, Belgium) is professor in financial engineering at the Catholic University of Leuven, Belgium. He has extensive practical experience of model implementation and is well known for his consulting work to the banking industry and other institutions. He is an independent expert advisor to the European Commission (DG-COMP) on “State aid assessment of valuation of impaired assets and of asset relief measures” and has assessed in that position more than EUR 1 trillion of assets; in particular he was one of the main expert advisors for the stress test on the Spanish banks and the related bailouts. Wim is the author of several books including “Contingent Convertibles (CoCos) : Structure and Pricing”, the first book ever on Contingent Capital and CoCo bonds (written together with Jan De Spiegeleer). Further he has been (co)author of the Wiley books “Lévy Processes in Finance”, “Lévy Processes in Credit Risk”, and “The Handbook of Convertible Bonds” and
the Springer books “Quantitative Assessment of Securitisation Deals” and “Stochastic Processes and Orthogonal Polynomials”. He is Managing Editor of the “International Journal of Theoretical and Applied Finance” and “Quantitative Finance” and Associate Editor of “Mathematical Finance”, “Review of Derivatives Research” and “International Journal of Portfolio Analysis & Management”. Further, he is series editor of the book series “Financial Engineering Explained” for Palgrave Macmillan. Finally, he is member of the Belgium CPI commission and enjoys making his own jam from time to time.