Group assignment

The students should study a particular model (or type of models) based on a Lévy process and some of its applications to finance. The main source of information should be the paper in the list about the model (or type of models). In order to search for more information, we recommend the bibliography of the course and/or the references cited in the paper. However, other sources of information or references can also be useful.

The students should produce an original report about the studied model, its main properties and some of its financial applications.

Moreover, the students should try to apply the model to real data in a simple case (a simple numerical implementation of the model), choosing one of the following two approaches:

1) Consider parameters for the model that were estimated in the paper or in some reference book (like the book of Schoutens, "Lévy processes in Finance" - see for instance tables 6.3. or 7.3 in this book) and with theses parameters, simulate the Lévy process considered in the paper in such a way that you can calculate (by Monte-Carlo simulation, for instance) the price of a exotic option. Examples of exotic options are Barrier options or Lookback options (see Chapter 9 of the book of Schoutens). If you cannot calculate the price of an exotic option, try to calculate the price of a call option or put option. If you cannot calculate the price of an option try, at least, to simulate the Lévy process. About the simulation of Lévy processes, you can start by reading the chapter 8 of Schoutens book and chapter 6 of the book of Cont and Tankov: Cont, R. and Tankov, P. (2003), Financial modelling with jump processes. Chapman and Hall/CRC Press .

2) Estimate the parameters of the model considered in the paper from real option price data (Calibration of the model to market option prices), following the procedure of Carr and Madan in the paper: Carr, P. and Madan D.B. (1999). Option valuation using the Fast Fourier Transform, Journal of Computational Finance, 2, pp 61-73. You can also see the section 11.1.3 of the book of Cont and Tankov and section 2.5.2 and chapter 6 of the book of Schoutens.

Moreover, the students should present their work in a 30 minutes short talk.

The maximum number of pages of the report should be 20 (without bibliography or appendixes). It should be delivered (both printed in paper and in a pdf file) before (or on) December, 7, 2017. The group assignments should be presented in class on December, 9 or December, 14.