

# 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.

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 simulate the model and use the model to calculate the price of some options, as described below.

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 these parameters try to:

- (1) Simulate trajectories of the Lévy process considered in the paper. 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) By Monte-Carlo simulation or using an appropriate closed form formula, calculate the price of call options with the same maturity and different strike price.
- (3) By using the Black-Scholes formula, and based on the prices obtained in part (2), calculate the implied volatility and plot the implied volatility against the strike. Comment the results obtained.
- (4) By Monte-Carlo simulation, calculate the price of an exotic option. Examples of exotic options are Barrier options or Lookback options (see Chapter 9 of the book of Schoutens).

Moreover, the students should present their work in a 20 minutes short talk.

The maximum number of pages of the report text should be 20 (without appendixes). The total maximum number of pages (with appendixes) should be 23. It should be delivered (both printed in paper and in a pdf file) before (or on) December, 6, 2018. The group assignments should be presented in class on December, 11 or December, 13.