A Hybrid Particle Swarm Optimization-Nelder- Mead Algorithm (PSO-NM) for Nelson-Siegel- Svensson Calibration

Authors : Sofia Ayouche, Rachid Ellaia, Rajae Aboulaich

Abstract : Today, insurers may use the yield curve as an indicator evaluation of the profit or the performance of their portfolios; therefore, they modeled it by one class of model that has the ability to fit and forecast the future term structure of interest rates. This class of model is the Nelson-Siegel-Svensson model. Unfortunately, many authors have reported a lot of difficulties when they want to calibrate the model because the optimization problem is not convex and has multiple local optima. In this context, we implement a hybrid Particle Swarm optimization and Nelder Mead algorithm in order to minimize by least squares method, the difference between the zero-coupon curve and the NSS curve.

Keywords : optimization, zero-coupon curve, Nelson-Siegel-Svensson, particle swarm optimization, Nelder-Mead algorithm

Conference Title : ICIFE 2016 : International Conference on Information and Financial Engineering

Conference Location : Paris, France

Conference Dates : April 25-26, 2016