THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Monte Carlo Simulation for HJM Model and Learning Networks for Pricing Caplets/ Floorlets

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ABSTRACT

This study presents the implementation of Monte Carlo Simulation for Heath- Jarrow-Morton(HJM) model as well as a nonparametric approach to pricing caplet. The Monte Carlo simulation exploits HJM Drift Condition to calibrate drift and applies Principal Component Analysis to estimate volatility from historical interest rate data. We examine the theoretical results of nonparametric pricing methods for caplet from the U.S. daily treasury yield curve rate in 2019 via learning networks and Monte Carlo simulation. To gauge the practical relevance of our methods, we apply it to the payoff of 2019 US LIBOR floorlet. Our results show Deep Neural Network(DNN) performs better than HJM in practice, even though it is impossible to beat HJM in theory.
