THE UNIVERSITY OF CHICAGO

Department of Statistics
MASTER'S THESIS PRESENTATION

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Non-Stationary Microstructure Noise in Financial Data: Integrated Volatility Estimation and Stationarity Testing

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ABSTRACT

This project is a step toward a better understanding of the nature of microstructure noise. In a hidden Ito semimartingale model, the microstructure noise can be endowed with various structures (i.i.d., stationary, etc.). However, real high-frequency data exhibits systematic diurnal patterns in both volatility and microstructure noise, indicating intra-day liquidity shifts. For this reason, two attempts are made in this project: 1) Correction of the border effect, with which we can show that a modified version of an existing estimator is consistent with mixing-normal asymptotic property; 2) Testing the hypothesis that the noise process is stationary based on the border effect correction and asymptotic approximation. Simulation studies corroborate our results, and the test statistic have shown the prevalence of non-stationary microstructure noise at the New York Stock Exchange using latest tick-by-tick data.