Limit theorems in asymptotic statistics for diffusions

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Abstract

Recent developments in limit theorems appearing in high-frequency financial data analysis will be discussed from probabilistic and statistical aspects. After studies of limit theorems for realized volatility, p-variations and multi-power variations in the regular sampling scheme, new trends of researches are toward irregular sampling, non-synchronicity, microstructure, and asymptotic expansion, as well as nonlinearity of parametric models. They include:
(i) p-variation under irregular sampling
(ii) Mixed normal limit theorems under non-synchronous random sampling scheme
(iii) Asymptotic expansion for the non-synchronous covariance estimator in central limit case
(iv) Lead-lag estimation and non-synchronicity
(v) Quasi-likelihood analysis for volatility Mixed normal type martingale
expansion applied to the realized volatility
(vi) Mixed normal type martingale expansion applied to the realized volatility
(vii) Conditional inference and conditional asymptotic expansion
(viii) Volatility derivatives
(ix) Market microstructure
(x) Implementation and data analysis