THE UNIVERSITY OF CHICAGO

Department of Statistics

DISSERTATION PROPOSAL

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Particles and Waves: In-Fill Asymptotic Analyses of Dynamic Data in Time and Frequency Domains

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Jones 111, 5747 S. Ellis Avenue

ABSTRACT

This dissertation proposal will touch on an inferential framework for smooth transforms of volatility in an asymptotic regime relevant to the rapidly growing TAQ database of WRDS from two distinct viewpoints. By time-domain techniques, this proposal suggests it is possible, through stable convergence of processes in law with the statistical uncertainty quantified by a tensor-valued function, to go beyond the current boundary of literature in the sense that a general inference is feasible under a noisy Ito semimartingale model with the state-of-the-art convergence rate. On the other hand, this proposal also hints at a work-in-progress solution to handle missing data in the same inferential framework through a frequency-domain technique combined with Ito's formula in hopes of making the issue more transparent that the adapted method does not require data alignment and likely offers a more elegant approach than time-domain counterpart. If time permits, other current work on the refinement and ramification will be discussed.

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