# Statistical Inferences for GQARCH-It\^{o} - Jumps Model Based on The Realized Range Volatility

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**Abstract :** This paper introduces a novel approach that unifies two types of models: one is the continuous-time jump-diffusion used to model high-frequency data, and the other is discrete-time GQARCH employed to model low-frequency financial data by embedding the discrete GQARCH structure with jumps in the instantaneous volatility process. This model is named "GQARCH-It\^{o} -Jumps mode." We adopt the realized range-based threshold estimation for high-frequency financial data rather than the realized return-based volatility estimators, which entail the loss of intra-day information of the price movement. Meanwhile, a quasi-likelihood function for the low-frequency GQARCH structure with jumps is developed for the parametric estimate. The asymptotic theories are mainly established for the proposed estimators in the case of finite activity jumps. Moreover, simulation studies are implemented to check the finite sample performance of the proposed methodology. Specifically, it is demonstrated that how our proposed approaches can be practically used on some financial data.

**Keywords :** It\^{o} process, GQARCH, leverage effects, threshold, realized range-based volatility estimator, quasi-maximum likelihood estimate

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