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Volatilities, Traded Volumes, and Price Increments in Derivative Securities KYUNGSIK KIM, Department of Physics, Pukyong National University, Pusan 608-737, Korea, GYUCHANG LIM, SOO YONG KIM, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 305-701, Korea, ENRICO SCALAS, Department of Advanced Sciences and Technology, East Piedmont University, Alessandria 15100, Italy — We apply the detrended fluctuation analysis (DFA) to the statistics of the Korean treasury bond (KTB) futures from which the logarithmic increments, volatilities, and traded volumes are estimated over a specific time lag. For our case, the logarithmic increment of futures prices has no long-memory property, while the volatility and the traded volume exhibit the existence of long-memory property. To analyze and calculate whether the volatility clustering is due to the inherent higher-order correlation not detected by applying directly the DFA to logarithmic increments of the KTB futures, it is of importance to shuffle the original tick data of futures prices and to generate the geometric Brownian random walk with the same mean and standard deviation. It is really shown from comparing the three tick data that the higher-order correlation inherent in logarithmic increments makes the volatility clustering. Particularly, the result of the DFA on volatilities and traded volumes may be supported the hypothesis of price changes.

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