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Long Memory in High Frequency Time Series Using Wavelets and Conditional Volatility Models

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The presence of spikes or cusps in high-frequency return series might generate problems in terms of inference and estimation of the parameters in volatility models. For example, the presence of jumps in a time series can influence the sample autocorrelations, which can cause misidentification or generate spurious ARCH effects. On the other hand, these jumps might also hide the proper heteroskedastic behavior of the dependence structure of a series, leading to identification issues and a poorer fit of a model. We propose a method to separate jumps with wavelet shrinkage in high-frequency financial series, fitting a suitable model that accounts for its stylized facts. We also perform simulation studies to assess the effectiveness of the proposed method, whereas also to exemplify the effect of the jumps in time series. Finally, we use the methodology to model real high-frequency time series of stocks traded in the Brazilian Exchange and OTC and a series of cryptocurrencies.

Palavras-chave: Volatility; Wavelets; High-Frequency Data; Jumps; Long Memory.

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