

Test for tail index constancy of GARCH innovations based on conditional volatility

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Abstract This study considers the problem of testing whether the tail index of the GARCH innovations undergoes a change according to the values of conditional volatilities. Special attention is paid to power-transformed and threshold generalized autoregressive conditional heteroscedasticity processes that can accommodate the GARCH family. We show that the proposed test asymptotically follows a functional of a standard Brownian motion under some regularity conditions. To evaluate our method, we carry out a simulation study and real data analysis using the return series of the Google stock price and DowJones index.

Keywords Constancy test for tail index · Heavy-tailed distribution · Conditional volatility · GARCH model · PTTGARCH model

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