Falsifying ARCH/GARCH Models Using Bispectral Based Tests

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Abstract:

This paper shows that the Hinich (1982) bispectrum test for gaussianity and the Hinich and Rothman (1998) test for time reversibility can be used to falsify the null hypothesis that an autoregressive conditionally heteroskedastic model (ARCH) of its generalization (GARCH) generates nonlinear behavior in the variance of an observed time series. The term "falsify" means that the null hypothesis can be rejected with a given size using a nonparametric test based on the bispectrum where the data is trimmed to control the sizes. Rejecting the null hypothesis implies that the ARCH or GARCH model that is estimated from the data is not a complete statistical description of the dependence structure in the variance of the process.