Modeling Threshold Conditional Heteroscedasticity with Regime-Dependent Skewness and Kurtosis

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Abstract:

In this paper, a threshold autoregressive model enabling regime-dependent skewness and kurtosis is proposed. The Gram-Charlier (GC) density is used as the innovation density. A threshold ARCH model with GC density (TARCHSK) is examined and the Lagrange-Multiplier (LM) test is developed. The test statistic is similar to Wong and Li's (1997) LM test on threshold ARCH model but allowing regime dependent kurtosis. This kurtosis-adjusted feature renders more accuracy and robustness. We apply TARCHSK models to some foreign exchange rate series.

Our kurtosis-adjusted test generates different conclusions from Wong and Li's test in that our test is more likely to accept the no threshold structure hypothesis. The model is then extended to threshold GARCH model with GC density (TGARCHSK). Finally, the proposed model is applied to some foreign exchange data.

(joint work with Wai-Keung Li, Xixin Cheng, Xuan Zhou)