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BAYESIAN EVALUATION OF MULTIPLE-REGIME NONLINEAR VOLATILITY MODELS

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A multiple-regime nonlinear volatility model with a fat-tailed error distribution is discussed. Bayesian estimation and inference is considered for this model, as well as Bayesian posterior model comparison among competing volatility models with different numbers of regimes. An adaptive MCMC sampling scheme is designed whose output achieves these goals. Our modeling framework provides a parsimonious representation of well-known stylized features of financial time series and facilitates statistical inference in the presence of high or explosive persistence and conditional heteroskedasticity. We focus on the three-regime case: the main feature of the model is allowing an explosive volatility regime and capturing mean and volatility asymmetries in financial markets. We illustrate our findings via simulation and an empirical study of eight international oil gas index markets. Most markets strongly support the three-regime model over its competitors.