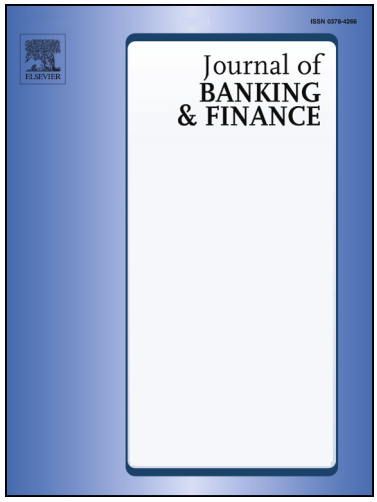

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Discrete Stochastic Autoregressive Volatility☆

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Abstract

We use Markov chain methods to develop a flexible class of discrete stochastic autoregressive volatility (DSARV) models. Our approach to formulating the models is straightforward, and readily accommodates features such as volatility asymmetry and time-varying volatility persistence. Moreover, it produces models with a low-dimensional state space, which greatly enhances computational tractability. We illustrate the proposed methodology for both individual stock and stock index returns, and show that simple first- and second-order DSARV models outperform generalized autoregressive conditional heteroscedasticity and Markov-switching multifractal models in forecasting volatility.

Keywords: Markov chain, time-varying transition probabilities, discrete autoregressive model, stochastic volatility, realized volatility

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