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## JOURNAL OF THE JAPAN STATISTICAL SOCIETY

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[\[Image PDF \(1045K\)\]](#) [\[References\]](#)**ESTIMATION OF ASYMMETRICAL VOLATILITY FOR ASSET PRICES: THE SIMULTANEOUS SWITCHING ARIMA APPROACH**Naoto Kunitomo<sup>1)</sup> and Seisho Sato<sup>2)</sup>1) *Faculty of Economics, University of Tokyo*2) *Institute of Statistical Mathematics*

**Abstract:** Asymmetrical movements between the downward and upward phases of sample paths of many financial time series have been noted by economists. By incorporating the conditional heteroskedasticity aspect into the nonstationary simultaneous switching autoregressive (SSAR) model, the asymmetrical volatility function of financial time series with daily effects can be easily estimated. We report a simple empirical result for stock price daily indices of the Nikkei-225 and SP-500 using this model.

**Key words:** Asymmetrical Volatility, Stock Prices, Simultaneous Switching AR Model, Conditional Heteroskedasticity, Daily Effect.

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