UNIVERSITÀ DEGLI STUDI DI BERGAMO
Dipartimento di Scienze aziendali, economiche e metodi quantitativi
Department of Management, Economics and Quantitative Methods

SEMINARIO

Progetto STARS

STaRs Supporting Talented Researchers - Azione 2: Visiting Professor

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Bergamo, Via dei Caniana 2 – sala Marida Bertocchi (ex aula 15)

Simple Estimators and Inference for Higher-order Stochastic Volatility Models

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ABSTRACT
We propose several estimators for higher-order stochastic volatility models, denoted by SV(p), where the latent volatility process is modeled as an AR(p) process. We discuss stationarity, ergodicity and mixing properties of SV(p) models. Proposed estimators include two simple estimators and GMM estimators. Several methods have been proposed in the literature to estimate SV(1) model, and mostly they are costly from the computational viewpoint, inflexible across models, not easy to implement and converge very slowly. Compared to these methods, our simple estimators for SV(p) models are computationally simple and very easy to apply in practice. Our simple estimators do not require choosing a sampling algorithm, initial parameters, and an auxiliary model. Using simple estimators, we develop recursive estimation procedures for SV(p) models. We derive asymptotic theories for these estimators and show the usefulness of these estimators in the context of simulation-based inference technique, i.e., Monte Carlo (MC) tests. By simulation, we compare our

proposed estimators to the popular Bayesian MCMC estimator. The simple ARMA based estimator, suggested by this study, in most cases outperforms other estimators in terms of bias and RMSE. For larger samples, it is uniformly superior to other estimators. Finally, empirical applications related to SV(p) models and simple ARMA based estimator are presented. First, SV(p) models fitted with S&P 500 index returns, and we found that these returns can be better modeled as an SV(p) model. We also implemented MC tests to construct more reliable inference and found evidence to support the above result. Second, we conducted out-of-sample forecasting experiments to study the accuracy of volatility forecasts among SV(p) models, GARCH models and Heterogenous Autoregressive model of Realized Volatility (HAR-RV) models. The results suggested that SV(p) models performed better than other competing volatility models for forecasting daily volatility. This result is consistent whether high volatility periods (such as Financial Crisis) are in the in-sample or in the out-of-sample. Our findings highlight the importance of using higher-order SV models for forecasting volatility.

Key words: generalized method of moments, Markov Chain Monte Carlo, Monte Carlo tests, stochastic volatility, asymptotic distribution, stock returns, realized variance, volatility forecasting, high frequency data.

Journal of Economic Literature classification: C15, C22, C53, C58.

Il seminario è aperto a tutti gli interessati

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