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Inferences in stochastic volatility models: a new simpler way. (English) Zbl 1407.62329

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Summary: Two competitive analytical approaches, namely, the generalized method of moments (GMM) and quasi-maximum likelihood (QML) are widely used in statistics and econometrics literature for inferences in stochastic volatility models (SVMs). Alternative numerical approaches such as Monte Carlo Markov chain (MCMC), simulated maximum likelihood (SML) and Bayesian approaches are also available. All these later approaches are, however, based on simulations. In this paper, we revisit the analytical estimation approaches and briefly demonstrate that the existing GMM approach is unnecessarily complicated. Also, the asymptotic properties of the likelihood approximation based QML approach are unknown and the finite sample based QML estimators can be inefficient. We then develop a precise set of moment estimating equations and demonstrate that the proposed method of moments (MM) estimators are easy to compute and they perform well in estimating the parameters of the SVMs in both small and large time series set up. A ‘working’ generalized quasi-likelihood (WGQL) estimation approach is also considered. Estimation methods are illustrated by reanalyzing a part of the Swiss-Franc and U.S. dollar exchange rates data.

For the entire collection see [\[Zbl 1347.62015\]](#).

MSC:

- [62M10](#) Time series, auto-correlation, regression, etc. in statistics (GARCH)
- [62P05](#) Applications of statistics to actuarial sciences and financial mathematics
- [62E15](#) Exact distribution theory in statistics

Keywords:

correlated squared observations; consistent estimation; generalized method of moments and complexity; kurtosis estimation; large sample properties; quasi-maximum likelihood estimation; simpler method of moments using fewer unbiased estimating equations; small sample comparison; time dependent variances; volatility parameters; analytical estimation

Software:

[STAMP](#) ; [FinTS](#)

Full Text: [DOI](#)

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