

A Computational Method to Generate Drift Independent Extreme Value Volatility Estimators

Rakesh Nigam, Parush Arora & Prachi Srivastava
Madras School of Economics

November 26, 2018

Abstract

An algorithm to construct a family of drift independent unbiased extreme value volatility estimators is developed when the log prices of assets follow Brownian motion with drift, as modelled in Rogers and Satchell (1991) [3]. From this family of estimators, the minimum variance estimator can be computed and is found to be competitive to the estimator of [3]. In the case of zero drift, both the Garman and Klass (1980) [1] and the Parkinson (1980) [2] estimators are recovered. The novelty of this approach is that it is constructive and, moreover it can be extended to compute estimators when prices follow more realistic models.

References

- [1] Garman, M. and Klass, M. J. *On the estimation of security price volatilities from historical data. J. Business* 53, 67-78. 1980
- [2] Parkinson, M. *The extreme value method for estimating the variance of the rate of return. J. Business* 53, 61-65. 1980
- [3] Rogers, L. C. G. and Satchell, S.E. *Estimating Variance from high, low and closing prices. Annals of Applied Probability* 1, 504-12 1991