

Long memory parameter estimation based on fractional spline wavelets

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Fractional splines extend Schoenberg's B-splines to fractional orders, which were proven to fulfill all requirements to form wavelet bases. Moreover, some of these fractional splines wavelets act approximately as fractional difference operators for signals that are essentially lowpass and concentrated around the origin, which makes them helpful in analyzing series with fractal behavior. In this article, we propose a novel estimator for the long memory parameter of a time series based on the fractional spline discrete wavelet transform (FrDWT), using the fact that it works approximately as a fractional differentiator. We perform simulations and examples to illustrate the proposed method. The proposed estimator outperforms traditional and widely used estimators in the simulation study. We also show that, as the sample size increases, the bias in the simulation tends to decrease, as well as the variance, which might indicate that the estimator is consistent. Finally, we provide applications in real time series, illustrating the good performance of the proposed estimator.

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References

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