

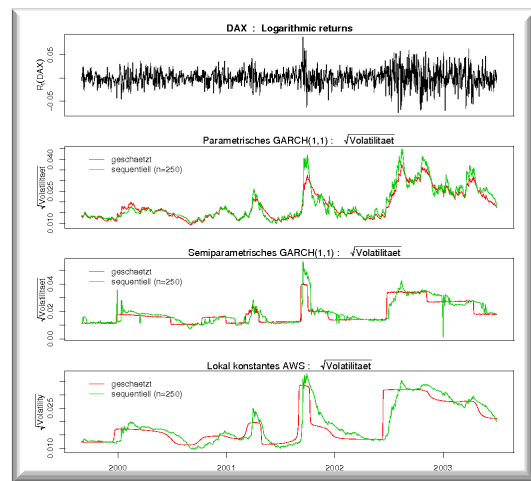
Nonstationary Modeling of Financial Time Series

Our Service

Our specialists in the field of applied statistics help you model your data. We offer a detailed consulting and the development of adequate models for the analysis of your financial time series.

Fields of Application

One main focus of our research is on the development of adaptive non- and semiparametric methods to model time series. New approaches for nonstationary time series and for the adaptive modeling of volatilities are particularly interesting for applications in finance. Normally, the analysis of time series is based on the stationarity of the underlying process. But this assumption is unrealistic, especially for financial time series. One consequence of the assumption of stationarity and of the use of parametric models is the appearance of the phenomena known as *Long-Range-Dependence* and *Heavy Tails*. Locally stationary approaches developed at WIAS enable an adequate modeling, a simpler interpretation of the models, a better prediction and a better assessment of the *Value-at-Risk*.



We Offer

- Volatility modeling with data adaptive local-stationary models (non- and semiparametric GARCH (EGARCH) models, piecewise stationary volatility models)
- Analysis of the time series' structure and determination of the intervals of local stationarity
- Interpretability of the results
- Explanation of the observed phenomena *Long-Range Dependence* and *Heavy Tails* by
- Nonstationary methods to predict the volatility

This more adequate modeling enables the determination of more exact critical values for the subsequent risk assessment.

k	1% quantile			5% quantile		
	1	5	10	1	5	10
AUD	0.7	0.2	0.7	3.9	3.1	2.8
CAD	1.5	1.7	1.9	5.6	7.2	6.6
BPD	1.0	0.9	0.9	4.2	4.2	3.2
JPY	1.0	1.4	1.3	4.4	4.9	4.8
SFR	1.0	1.3	1.6	4.5	5.0	5.8

Example: Observed frequency of exceeding the estimated *Value-at-Risk* for different time horizons (k days) and for different currencies: Australian Dollars (AUD), British Pounds (BPD), Canadian Dollars (CAD), Japanese Yen (JPY), Swiss Francs (SFR).

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