STYLIZED FACTS OF FINANCIAL TIME SERIES AND REGIME SWITCHING MODELS

Zamora-Sillero E.

Research and Development Department, GET Capital AG, Heinz-Nixdorf-Strasse 31, 41179 Monchengladbach, Germany

Regime switching models mimic the tendency of financial markets to often change their behavior abruptly. Recently the applicability of such models to analyze and forecast the behavior of financial markets has been strongly improved by the development of novel Bayesian inference algorithms. Such methods permits online and the exact calculations of both the likelihood of the regime switching model and the posteriors predictive for the market returns during the next interval under study.

Here we analyze a regime switching model with a constant hazard function and iid Gaussian returns with changing mean and variance sampled from a Normal-Inverse-Gamma distribution in case of a regime switch. A constant hazard implies the presence of a regime change point at time t is determined by a weighted coin flip independent of how long it has been since the last change point. We use real daily data of the German index DAX 30 and a maximum likelihood approach to parametrize such a model. In addition we derive exact formulae for the marginal probability distribution of the returns, and the marginal autocorrelations of the returns and the squared returns. These results show consistency with fundamental empirical observations across financial markets i.e. distribution of returns approximately symmetric with positive excess kurtosis and power law tails, mild autocorrelations of returns, and significant autocorrelations of the squared returns.