Regime-switching Models for Financial Volatility

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Abstract

In this paper, we consider dynamic volatility models based on discrete mixture distributions. First we briefly discuss properties and economic intuition of mixtures, and why they constitute an attractive model for financial return data. Subsequently, mixture models for the evolution of volatility are introduced, including normal mixture and Markov-switching GARCH as well as more general specifications for the mixing process. Estimation issues and aspects of stationarity and the moments structure of mixture GARCH processes will be discussed, as far as they help to map intuition to the model. We review several applications to options valuation, asset pricing, futures hedging and risk estimation that have appeared in the literature, and illustrate the main issues by means of a detailed stock market example. Finally, we will summarize the extensions to the multivariate case, including directions of current research.

(joint with Marc Paolella)