Regime Switch Models on Inflation Modelling

An Economic Scenario Generator (ESG) Algorithm for Solvency II

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Abstract

Here we propose a method to capture the fluctuations of inflation (measured by Consumer Price Index (CPI)) by Dynamic Markov Regime Switch Models. First the inflation growth rate for each specific periods of time is modelled by one time series process choose from two (or more) different AutoRegressive Integrated Moving Average (ARIMA) models. Then, a hidden Markov Chain is built to model the switching process from the two (or more) processes. Finally, Broyden-Fletcher-Goldfarb-Shanno (BFGS) method, Simulation Method of Moments (SMM) and Markov Chain Monte Carlo Method (MCMC) are all used to provide both deterministic and Bayesian estimations of all the parameters. This model can potentially provide a better estimation for real economic factor behaviours like the movements of inflation. Furthermore, the estimation of the hidden Markov chain, which acts like an unobservable force guiding the switching procedures, can also be used as an approximation for the length and dynamics of business cycles. The algorithm is developed as a part of our ESG system.

Keywords:
Inflation Modelling, Markov Regime Switch, SMM, MCMC, Business Cycles

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