Alternate Regime Switching Model for Forecasting Inflation

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Inflation series in the postwar United States appears to have undergone occasional abrupt shifts in both its mean level and variability. Markov switching models developed by Hamilton are especially designed to capture such phenomena. These models have been fit to the US inflation rates by a number of studies.

However, the discrete nature of the regimes admitted by these models poses a drawback in some empirical applications. Furthermore, computational requirements (in terms of memory storage) severely limit the admissible regimes to a small number. These particular drawbacks seem especially important when modeling the US inflation.

In a paper that appeared in JASA, Kitagawa (1987) proposes using linear state space models with heavy-tailed errors for capturing shifts in the mean and/or variance of a time series. One notable advantage of these models is that they can capture a continuum of regime changes.

In a recent paper, McCulloch (1997) proposes state space models with the signal shocks drawn from compound distributions for modeling regime changes. In these models a Bernoulli process governs whether a regime change occurs in any given period. In the event a regime change does occur, the magnitude of the change is a random variable that is drawn from a well-specified probability distribution. In this paper we compare the performance of these three models for forecasting the monthly US inflation series. We find that all three models have very similar performance when evaluated in terms of the mean squared or mean absolute forecast errors. However, the latter two models are considerably more parsimonious, and easily beat the more profligately parameterized Markov switching models in terms of standard model selection criteria, such as the AIC or the SBC.

Keywords: Markov switching models; state space models; autoregressive conditional heteroskedasticity; symmetric stable distributions; Sorenson-Alspach recursive filter; U.S. inflation forecasting.
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