



The University of Chicago  
Department of Statistics

MASTER'S THESIS PRESENTATION

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## **Estimation of Markov Switching ARMA Model**

**THURSDAY, November 10, 2011, at 10:30 AM**

110 Eckhart Hall, 5734 S. University Avenue

### **ABSTRACT**

Regime switching models, especially Markov Switching (MS) models, are regarded as a promising way to capture nonlinearities in time series. This paper mostly focuses on Markov Switching ARMA model which is widely used to describe abrupt break in financial data. Combining the elements of Markov Switching models with full ARMA models poses some difficulties for the computation of parameters estimation. Maximum likelihood estimation (MLE) and Monte Carlo Markov Chain (MCMC) are proposed to fit this problem. In this article, we demonstrate the derivation and algorithm of both approaches. They are illustrated on simulated data and with American GNP data. Meanwhile a likelihood ratio test is proposed to see the necessary of regime switching.

*Key words:* Regime Switching, Markov Switching, MS-ARMA, MLE, MCMC, Bayesian Estimation

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