

Bayesian Inference for Credit Risk with Serially Dependent Factor Model

*Yi-Ping Chang*¹, *Chih-Tun Yu*² and *Huimei Liu*²

¹Soochow University and ²National Chengchi University

Abstract

Default probability and asset correlation are key factors in determining credit default risk in loan portfolios. Therefore, many articles have been devoted to the study in quantifying default probability and asset correlation. However, the classical estimation methods (e.g. MLE) usually use only historical data and often underestimate the default probability in special situations, such as the occurrence of a financial crisis. By contrast, the Bayesian method is seen to be a more viable alternative to solving such estimation problems. In this paper, we consider the Bayesian approach by applying Markov chain Monte Carlo (MCMC) techniques in estimating default probability and asset correlation under serially dependent factor model. The empirical results and out-of-sample forecasting for S&P default data provide strong evidence to support that the serially dependent factor model is reliable in determining credit default risk.

Keywords: Default probability, asset correlation, serially dependent factor model, Bayesian inference.