Bayesian Inference for Issuer Heterogeneity in Credit Ratings Migration

Ashay Kadam and Peter Lenk

Comments by

Francesco Corielli

Dept. of Finance, Bocconi University

Summary

- The paper presents a continuous time discrete space Markov model for rating transitions
- The model features partially structured heterogeneous migration behaviour
- The model is estimated on Moody’s data using bayesian MCMC methods

Motivation

- Continuous time models fit better than Markov chains
- Heterogeneity is an agreed upon problem
- In general a given discrete sequence of rating transition matrices cannot be generated by an (homogeneous) continuous time Markov process

Comments to Motivation

- Continuous time models are more natural in a setting where transitions are recorded in continuous time, moreover transitions over arbitrary time intervals can be derived (comments on this in the paper)
- Heterogeneity ok . Markov?????? (chains of distress)
- Discrete-continuous time… embedding. It depends on the assumption of homogeneity which is unlikely but standard

Data. Moody's.

- Beware of window dressing (not just for Moody's for transitions from high rating to deault or quasi default
- Transition probability should depend on time of latest transition.

Bayesian analysis

- Sparse data, flat or degenerate lik. funct. Bayesian methods exploit borrowing strength (with informative priors)
- However, need for MCMC methods (convergence?)
- How much do posterior distributions depend on prior distribution choice when data is scarce? (even if we are very non informative there are many ways of being non informative)

Reporting of a bayesian analysis

- The main weakness of the paper, in the present state, lies in the reporting of results
- In a standard frequentist approach minimal reports are point estimates and sampling sdev.
- In bayesian analysis we must choose among many possible reports

Reporting of a bayesian analysis

- First choice: distribution of what (here parameters are less relevant than transition matrices)
- Second choice: posterior or predictive
- Third choice: which summary of posterior or predictive distribution

Reporting of a bayesian analysis

- For instance: table 4 reports:

> Of primary interest to us is the generator for the continuous time Markov chain, and a one year transition probability matrix. In Table 4 we present these estimates for US issuers in the Industrial sector. These issuers make up more than half of our data, and

- Are these derived from posterior modes of the parameters, or are they posterior means? (end of sect. 3: this seems to be the case)

Reporting of a bayesian analysis

- Posterior means, or modes, in a sparse data setting are quite uninformative
- The paper does not report statistics on posterior dispersion (while one of the reason ob the use of Bayesion methods was that ML with sparse data yields big standard errors)
- VaR-cap requirements, how are they computed. Using posterior means of generators?

Conclusions

- Interesting paper
- Bayesian estimation methods require bayesian reporting of results
- Heterogeneity matters, we never doubted this but a suitable quantification is relevant.
- Homogeneous processes?