

## 跳跃—扩散条件下信用风险相关性度量的变结构Copula模型

罗长青<sup>1,2</sup>, 朱慧明<sup>1</sup>, 欧阳资生<sup>2</sup>

1. 湖南大学工商管理学院, 湖南 长沙 410082;
2. 湖南商学院财政金融学院, 湖南 长沙 410206

### Variable Structure Copula Models of Credit Risk Correlation under the Condition of Jump-Diffusion Process

LUO Chang-qing<sup>1,2</sup>, ZHU Hui-ming<sup>1</sup>, OUYANG Zi-sheng<sup>2</sup>

1. College of Business Administration, Hunan University, Changsha 410082, China;
2. College of Finance, Hunan University of Commerce, Changsha 410206, China

- 摘要
- 参考文献
- 相关文章

Download: PDF (2287KB) HTML (1KB) Export: BibTeX or EndNote (RIS) Supporting Info

**摘要** 针对现有研究大多只考虑扩散条件的不足, 构建了跳跃—扩散条件下信用风险相关性度量的变结构Copula模型。运用1991~2010年中国上市公司的数据构建了行业信用风险指数, 运用双指数跳跃扩散模型来识别行业信用风险的跳跃扩散点, 发现在样本期, 共同因素与行业特质因素引发了行业信用风险的多次跳跃。在识别跳跃点的基础上, 构建了变结构Copula模型, 该模型能较准确地描述信用风险相关性的变化, 各行业之间的信用风险相关系数在0.5以上, 并且上市公司信用风险的变化呈现出“一损俱损”的特征, 而“一荣俱荣”的特征并不明显。构建的模型及实证结论将有助于理解信用风险相关或传染, 从而为信贷组合管理和风险管理提供更多的方法与经验。

**关键词:** 跳跃-扩散 双指数模型 变结构Copula 信用风险相关性

**Abstract:** According to the shortcoming of the current literatures that stress more on the diffusion process, variable structure Copula models are constructed for credit risk correlation evaluation under the condition of jump-diffusion process. By applying the Chinese Listed Companies data from 1991 to 2010, the industry indexes of credit risk are calculated, and the empirical results show that the common factor and the industry idiosyncrasy factors lead the jump several times during the sample period. On the basis of identifying the variable structure points, the variable structure copula models are constructed. The results show that the models can describe the credit risk correlation accurately, and the dynamic correlation coefficients are above 0.5 for all industry match-up. Meanwhile, it can also found that the credit risk of different companies rise together, but it may not fall together. The models and conclusions are helpful to understand the credit risk correlation or contagion, thus they can provide more methods and instructions for the credit portfolio management and risk management.

收稿日期: 2012-09-10;

基金资助:

国家自然科学基金创新研究群体项目(71221001); 国家社科基金资助项目(11BTJ011) 教育部人文哲学社会科学青年基金项目(13YJCZH123); 中国博士后科研基金项目(2013M542111)

**作者简介:** 罗长青(1983-), 男(汉族), 湖南长沙人, 湖南大学工商管理学院, 博士, 研究方向: 金融工程与风险管理。

**引用本文:**

罗长青, 朱慧明, 欧阳资生. 跳跃—扩散条件下信用风险相关性度量的变结构Copula模型[J] 中国管理科学, 2014, V22(3): 1-12

#### Service


















- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- Email Alert
- RSS

#### 作者相关文章

- 罗长青
- 朱慧明
- 欧阳资生

[1] Markowitz H. Portfolio selection: Efficient diversification of investments[M]. New York: Wiley, 1959.

[2] Luenberger D G. Investment science[M]. New York: Oxford University Press, 1998.

- [3] Chen N, Kou S G. Credit spreads, optimal capital structure, and implied volatility with endogenous default and jump risk[J]. *Mathematical Finance*, 2009, 19(3): 343-378. 
- [4] Cover T M, Gluss D H. Empirical Bayes stock market portfolios[J]. *Advances in applied mathematics*, 1986, 7(2):170-181. 
- [5] Kou S G. A jump diffusion model for option pricing[J]. *Management Science*, 2002, 48(8): 1086-1101. 
- [6] Cover T M, Thomas J A. *Elements of information theory*[M]. New York: John Wiley & Sons, 1991. 
- [7] Patton A J. Estimation of multivariate models for time series of possibly different lengths[J]. *Journal of Applied Econometrics*, 2006, 21(2): 147-173. 
- [8] Breiman L. Optimal gambling systems for favorable games[J]. *Proceedings of the Berkeley Symposium on Mathematical Statistics and Probability*, 1961, 1:65-78.
- [9] Györfi L, Ottucsák G, Urbán A. Empirical log-optimal portfolio selections: a survey[R]. Working Paper, Budapest University of Technology and Economics, 2007. 
- [10] Hastings W K. Monte Carlo sampling methods using Markov chains and their applications[J].*Biometrika*, 1970, 57(1): 97-109. 
- [11] 朱慧明, 郝立亚, 虞克明, 等. 基于MCMC模拟的贝叶斯复合状态信用溢价模型研究. *中国管理科学*, 2011, 19(3): 1-10. 浏览
- [12] Robert M C. Option pricing when underlying stock returns are discontinuous[J]. *Journal of Financial Economics*, 1976, 3(1-2): 125-144. 
- [13] Lo A W, MacKinlay A C. Stock market prices do not follow random walks: Evidence from a simple specification test[J]. *Review of Financial Studies*, 1988, 1(1):41-66. 
- [14] 刘兴华, 杨建梅. 证券市场的条件可预测性分析[J]. *管理科学学报*, 2008, 11(6):77-83.
- [15] Kou S G. A jump diffusion model for option pricing[J]. *Management Science*, 2002, 48(8): 1086-1101. 
- [16] 张世英, 张彤. 双指数跳跃扩散模型的MCMC估计[J]. *系统工程学报*, 2006, 21(2): 113-118. 
- [17] 刘晓曙. 三种双指数跳跃扩散模型实证比较研究[J]. *南方经济*, 2008, (2): 64-72. 
- [18] Györfi L, Schafer D. Nonparametric prediction[M]//. Suykens J A K, Horváth G, Basu S, et al. *Advances in learning theory: Methods, models and applications*. Netherlands: IOS Press, 2003. 
- [19] Lin Shuling. A new two-stage hybrid approach of credit risk in banking industry[J]. *Expert System with Applications*, 2009, 36(4): 8333-8341. 
- [20] Györfi L, Urbán A, Vajda I. Kernel-based semi-log-optimal empirical portfolio selection strategies[J]. *International Journal of Theoretical and Applied Finance*, 2007, 10(3):505-516. 
- [21] Yu Lean, Yue Wuyi, Wang Shouyang, et al. Support vector machine based multi-agent ensemble learning for credit risk evaluation[J]. *Expert System with Applications*, 2010, 37(2): 1351-1360. 
- [22] Györfi L, Udina F, Walk H. Nonparametric nearest neighbor based empirical portfolio selection strategies[J]. *Statistics and Decisions*, 2008, 26(2):145-157.
- [23] Nguyen P. Macroeconomic factors and Japan's industry risk[J]. *Journal of Multi-national Financial Management*, 2007, 17(2): 173-185. 
- [24] Borodin A, El-Yaniv R, Gogan V. Can we learn to beat the best stock[J]. *Journal of Artificial Intelligence Research*, 2004, 21:579-594.
- [25] Ruud V. Modeling industry-level corporate credit risk for the netherlands[R]. Working paper, De Nederlandsche Bank, 2008.
- [26] Kjell B N. A model for predicting aggregated corporate credit risk[J]. *Economic Bulletin of Norges Bank*, 2010, 81(1): 25-34.
- [1] 谈正达, 胡海鸥. 短期利率跳跃-扩散模型的非参数门限估计[J]. *中国管理科学*, 2012,(1): 8-15
- [2] 胡素华, 张世英, 张彤. 金融工程中资产收益的连续时间模型评述[J]. *中国管理科学*, 2006,(2): 24-32
- [3] 张利兵, 梁好, 潘德惠. 考虑事件风险的在险价值研究[J]. *中国管理科学*, 2005,(2): 113-117

