中国管理科学 2013, Vol. 21 Issue (5) :8-14
论文

随机利率下跨期多事件触发巨灾债券定价研究

李永, 胡帅, 范蓓

同济大学经济与管理学院, 上海 200092

Pricing of Inter-temporal Multi-events Triggered Cat Bond Under Stochastic Interest Rates Model

LI Yong, HU Shuai, FAN Bei

School of Economics and Management, Tongji University, Shanghai 200092, China

- 摘要
- 参考文献
- 相关文章

Download: PDF (1388KB) HTML (1KB) Export: BibTeX or EndNote (RIS) Supporting Info

摘要 巨灾债券兼具规避巨灾风险和投资功能,既是对巨灾救助体制的有力补充,又为资本市场提供了较高收益率的零贝塔债券。多事件触发巨灾债券只有当多个触发指标被同时满足时才会损失本金,投资风险小于单事件触发巨灾债券,具有更大市场潜力。结合中国的台风历史损失数据,可构建多事件触发巨灾债券的定价模型,结合Copula函数拟合的双触发指标的联合分布,在利率服从Vasicek随机利率模型的假设下完成多事件触发巨灾债券的定价过程,并得出利率的随机因素对跨期定价结果的影响。

关键词： 巨灾债券 多事件触发 Copula函数 随机利率

Abstract： Catastrophe bond (Cat bond) can be used to hedging catastrophe risks while it is also a kind of high return rate zero-beta bond. Multi-event triggered Cat bond can only be triggered when two or more indexes are met at the same time, making it of lower risks comparing to those single-event triggered ones. In order to pricing a two indexes triggered Cat bond, firstly the joint distribution of indexes is fitted by using a Copula method. Then, based on representative agent pricing model under stochastic interest rates driven by Vasicek model,the pricing model is proposed. The impacts of interest rate on Cat bond's intertemporal pricing results can be measured properly in this way. The model proposed in this paper is a impetus to the pricing of multi-events triggered Cat bond considering stochastic interest rates and will help to understand how interest rates affect Cat bonds' prices.

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
李永
胡帅
范蓓

收稿日期: 2011-10-23;

基金资助:国家社会科学基金资助项目(09CJY091);2012年中央高校基本科研业务费专项

引用本文:
李永, 胡帅, 范蓓 .随机利率下跨期多事件触发巨灾债券定价研究[J] 中国管理科学, 2013,V21(5): 8-14

[1] Courbage C, Stahel W R. The geneva reports risk and insurance research extreme events and insurance: 2011 annus horribilis[R]. The Geneva association, 2012:7-12.

[2] Cummins J D. CAT bonds and other risk-linked securities-state of the market and recent developments[J]. Risk Management and Insurance Review, 2008, 11(1):23-47.

[3] Litzenberger R H, Beaglehole D R, Reynolds C E.Assessing catastrophe reinsurance-linked securities as a new asset class [J]. Journal of Portfolio Management, 1996, special issue:76-86.

[4] Dieckmann S. By force of nature: explaining the yield spread on catastrophe bonds[R].Wording paper, Wharton Finance Department, University of Pennsylvania, 2010.

[5] Hagendorff B, Hagendorff J, Keasey K. The shareholder wealth effects of insurance securitization: preliminary evidence from the catastrophe bond market [J]. Journal of Financial Services Research, 2012.

[6] Papachristou D. Statistical analysis of the spreads of catastrophe bonds at the time of issue [J]. ASTIN Bulletin, 2011, 41(1): 251-277.

[7] Braun A. Determinants of the cat bond spread at issuance [J]. Zeitschrift für die gesamte Versicherungswissenschaft, 2012, 101(5): 721-736.

[8] Woo G. A catastrophe bond niche: multiple event risk[R]. Working paper,NBER Insurance Group Workshop, Cambridge, 2004.

[9] Reshetar G. Pricing of multiple-event coupon paying CAT bond[R]. Working paper,Swiss Banking Institute, 2008.

[10] Poncet P, Vaugirard V E. The pricing of insurance-linked securities under interest rate uncertainty[J]. Journal of Risk Finance, 2002, 3(3): 48-59.

[11] Wu Y C, Liao S L, Shyu S D. Pricing catastrophe insurance derivatives with stochastic interest rates and regime-switching jump diffusion losses[J]. The Icfai University Journal of Risk & Insurance, 2008, 5(4):7-28.

[12] Cox S H, Pedersen W H. Catastrophe risk bonds[J].North American Actuarial Journal, 2000, 4(4):56-82.

[13] Jaimungal S, Wang Tao. Catastrophe options with stochastic interest rates and compound poisson losses [J]. Insurance: Mathematics and Economics, 2006, 38(3):469-483.

[14] Cummins J D, Geman H. Pricing catastrophe insurance futures and call spread: an arbitrage approach [J].Journal of Fixed Income, 1995, 4 (4): 46-57.

[15] Loubergé H, Kellezi E, Gilli M. Using catastrophe-linked securities to diversify insurance risk: a financial analysis of Cat bonds [J]. Journal of Insurance Issues, 1999, 22(2): 125-146.

[16] Sklar A. Random variables: joint distribution functions and copulas [J].Kybernetika, 1973, 9(6):449- 460

[17] Mendes B, Measuring financial risks with copulas[J].International Review of Financial Analysis, 2004, 13(13):27-45.

[18] 施建详,邬云玲.我国巨灾保险风险证券化研究——台风灾害债券的设计[J].金融研究, 2006(5): 103-112.

[19] 田玲,向飞. 基于风险定价框架的巨灾债券定价模型比较研究[J].武汉大学学报(哲学社会科学版),2006(3):168-174.

[20] 李永,刘鹃.基于无套利利率模型的台风巨灾债券定价研究[J].预测, 2010, 29(1):49-53.

[21] 谢世清.巨灾债券的精算定价模型评析[J].财经论丛, 2011(1):70-76.

[1] 陆静, 张佳.基于极值理论和多元Copula函数的商业银行操作风险计量研究[J]. 中国管理科学, 2013,21(3): 11-19

[2] 戴晓凤, 梁巨方.基于时变Copula函数的下偏矩最优套期保值效率测度方法研究[J]. 中国管理科学, 2010,18(6): 26-32

[3] 叶文忠, 杨招军, 郑毅.抵押贷款证券的效用无差别定价[J]. 中国管理科学, 2010,18(4): 21-27

[4] 赵巍, 何建敏.基于测度变换方法的随机型创新幂式期权定价[J]. 中国管理科学, 2009,17(3): 34-39

[5] 李健伦, 方兆本.估算我国保监会对产险业的容许破产概率[J]. 中国管理科学, 2006,(4): 6-12

[6] 范辛亭, 方兆本.随机利率条件下可转换债券定价模型的经验检验[J]. 中国管理科学, 2001,(6): 7-14