

基于数据驱动平滑检验的密度预测评估方法——以香港恒生指数、上证综指和台湾加权指数为例

张玉鹏¹, 王茜²

1. 华东师范大学金融与统计学院, 上海 200241;
2. 上海对外经贸大学WTO学院, 上海 200336

Density Forecast Evaluation based on Data-Driven Smooth Test—Taking HSI, SHCI and TWII for Example

ZHANG Yu-peng¹, WANG Qian²

1. School of Finance and Statistics, East China Normal University, Shanghai 200241, China;
2. School of WTO, Shanghai University of International Business and Economics, Shanghai 200336, China

- 摘要
- 参考文献
- 相关文章

Download: PDF (972KB) [HTML](#) (1KB) Export: BibTeX or EndNote (RIS) Supporting Info

摘要 本文提出了样本内和样本外密度预测评估的数据驱动平滑检验 (data-driven smooth test) 方法, 并分别采用Newey-Tauchen的方法以及West-McCracken的方法来纠正参数估计对样本内和样本外密度预测评估的影响。运用本文提出的检验方法, 我们比较了各种最大熵GARCH模型对中国三个股指数据 (香港恒生指数、上证综合指数和台湾加权指数) 的样本内和样本外预测绩效。结果显示: (1) 最大熵GARCH模型可以用来刻画中国股指数据的典型化事实, GARCH模型中考虑了厚尾和偏态特征的Pearson IV分布对中国股指收益率的样本外预测绩效是很重要的; (2) 具有较好样本内拟合优度和样本内预测效果的模型未必有很好的样本外密度预测效果, 考虑到样本外预测的重要性, 实际应用中我们应采用具有较好样本外预测效果的模型。

关键词: 密度预测评估 最大熵GARCH模型 数据驱动平滑检验 概率积分变换

Abstract: In this paper, a data-driven smooth test for in-sample and out-of-sample density forecast evaluation is developed, the Newey-Tauchen method and the West-McCracken method are applied separately to correct the effects of the parameter estimation on the in-sample and out-of-sample test statistics. Then, procedure proposed is applied to analyze the in-sample and the out-of-sample forecast performance of various maximum entropy GARCH models for three stock indexes-HSI, SHCI and TWII. The results justify that the maximum entropy GARCH model could be used to capture excess kurtosis, asymmetry and high peakedness generally observed in financial data, the Pearson type IV distribution which taking care of fat tail and skewed conditional distribution in GARCH-type models is of importance for the stock return density forecast. Moreover, it can be found that better in-sample goodness-of-fit and forecast performance does not imply better out-of-sample forecast performance.

收稿日期: 2011-09-12;

基金资助:

国家自然科学基金青年项目 (71301053); 教育部人文社会科学研究青年基金项目 (13YJC790211); 上海对外经贸大学085项目 (Z085YYJ13014); 上海市高校青年教师培养资助计划

作者简介: 张玉鹏 (1980-), 男 (汉族), 山东烟台人, 华东师范大学金融与统计学院讲师, 博士, 研究方向: 计量经济学、金融计量经济学。

引用本文:

张玉鹏, 王茜. 基于数据驱动平滑检验的密度预测评估方法——以香港恒生指数、上证综指和台湾加权指数为例[J]. 中国管理科学, 2014, V22(3): 130-140

[1] Atanassov K T. Intuitionistic fuzzy sets[J]. Fuzzy Sets and Systems, 1986, 20(1): 87-96. 

[2] 梁昌勇, 张恩桥, 戚筱雯, 等. 一种评价信息不完全的混合型多属性群决策方法[J]. 中国管理科学, 2009, 17(4): 126-132. 浏览























[3] Clements M P, Smith J. Evaluating the forecast densities of linear and non-linear models: Applications to output growth and unemployment













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

- 张玉鹏
- 王茜

- [J]. *Journal of Forecasting*, 2000, 19(4): 255-276. 3.0.CO;2-G target="_blank"> 
- [4] Shu M H, Cheng C H, Chang J R. Using intuitionistic fuzzy sets for fault tree analysis on printed circuit board assembly[J]. *Microelectronics Reliability*, 2006, 46(12): 2139-2148. 
- [5] De Gooijer J G, Hyndman R J. 25 years of time series forecasting[J]. *International Journal of Forecasting*, 2006, 22(3): 443-473. 
- [6] Li Dengfeng. A note on "using intuitionistic fuzzy sets for fault-tree analysis on printed circuit board assembly"[J]. *Microelectronics Reliability*, 2008, 48(10): 1741. 
- [7] Amisano G, Giacomini R. Comparing density forecasts via weighted likelihood ratio tests[J]. *Journal of Business and Economic Statistics*, 2007, 25(2): 177-190. 
- [8] Corradi V, Swanson N. Predictive density and conditional confidence interval accuracy tests[J]. *Journal of Econometrics*, 2006a, 135(1): 187-228.
- [9] Nan Jiangxia, Li Dengfeng, Zhang Maojun. A lexicographic method for matrix games with payoffs of triangular intuitionistic fuzzy numbers [J]. *International Journal of Computational Intelligence Systems*, 2010, 3(3): 280-289.
- [10] Diebold F X, Gunther T, Tay A S. Evaluating density forecasts, with applications to financial risk management[J]. *International Economic Review*, 1998, 39(4): 863-883. 
- [11] Li Dengfeng. A ratio ranking method of triangular intuitionistic fuzzy numbers and its application to MADM problems[J]. *Computers and Mathematics with Applications*, 2010, 60(6): 1557-1570. 
- [12] Bai J. Testing parametric conditional distributions of dynamic models[J]. *Review of Economics and Statistics*, 2003, 85(3): 531-549. 
- [13] Li Dengfeng, Nan Jiangxia, Zhang Maojun. A ranking method of triangular intuitionistic fuzzy numbers and application to decision making[J]. *International Journal of Computational Intelligence Systems*, 2010, 3(5): 522-530. 
- [14] Corradi V, Swanson N. Bootstrap conditional distribution tests in the presence of dynamic misspecification[J]. *Journal of Econometrics*, 2006, 133(2): 779-806. 
- [15] Yue Xiaoyun, Zou Dewen, Guo Yajun, et al. A multi-attribute group decision method based on triangular intuitionistic fuzzy number[J]. *Communications in Computer and Information Science*, 2011, 244(6): 486-493. 
- [16] Hong Yongmiao, Li Haitao. Nonparametric specification testing for continuous-time models with applications to term structure of interest rates[J]. *Review of Financial Studies*, 2005, 18(1): 37-84.
- [17] Chen Dongfong, Zhang Lei, Jiao Jingshan. Triangle fuzzy number intuitionistic fuzzy aggregation operators and their application to group decision making[J]. *Lecture Notes in Computer Science*, 2010, 6320: 350-357. 
- [18] Hong Yongmiao, Li Haitao, Zhao Feng. Can the random walk model be beaten in out-of-sample density forecasts? Evidence from intraday foreign exchange rates[J]. *Journal of Econometrics*, 2007, 141(2): 736-776. 
- [19] Robinson J, Henry Amirtharaj E C. A search for the correlation coefficient of triangular and trapezoidal intuitionistic fuzzy sets for multiple attribute group decision making[J]. *Communications in Computer and Information Science*, 2012, 283(1): 333-342. 
- [20] 王坚强, 聂荣荣. 准则关联的直觉模糊多准则决策方法[J]. *控制与决策*, 2011, 26(9): 1348-1352.
- [21] 王坚强, 张忠. 基于直觉梯形模糊数的信息不完全确定的多准则决策方法[J]. *控制与决策*, 2009, 24(2): 226-230.
- [22] 万树平, 董九英. 多属性群决策的直觉梯形模糊数法[J]. *控制与决策*, 2010, 25(5): 773-776.
- [23] Khmaladze E V. Martingale approach in the goodness-of-fit tests[J]. *Theory of Probability and its Applications*, 1982, 26(2): 240-257. 
- [24] Ye Jun. Expected value method for intuitionistic trapezoidal fuzzy multicriteria decision-making problems[J]. *Expert Systems with Applications*, 2011, 38(9): 11730-11734. 
- [25] Neyman J. Smooth test for goodness of fit[J]. *Scandinavian Aktuarietidskr*, 1937, 20(3-4): 149-199.
- [26] Ye Jun. Multicriteria group decision-making method using vector similarity measures for trapezoidal intuitionistic Fuzzy Numbers[J]. *Group Decision and Negotiation*, 2012, 21(4): 519-530. 
- [27] Janssen A. Global power functions of goodness of fit tests[J]. *The Annals of Statistics*, 2000, 28(1): 239-253. 
- [28] Wu Jian, Cao Qingwei. Same families of geometric aggregation operators with intuitionistic trapezoidal fuzzy numbers[J]. *Applied mathematical modelling*, 2013, 37(1): 318-327. 
- [29] 万树平. 基于区间直觉梯形模糊数的多属性决策方法[J]. *控制与决策*, 2011, 26(6): 857-861.
- [30] 万树平. 基于分式规划的区间直觉梯形模糊数多属性决策方法[J]. *控制与决策*, 2012, 27(3): 455-458.
- [31] Escanciano J C. On the lack of power of omnibus specification tests[J]. *Econometric Theory*, 2009, 25(1): 162-194. 
- [32] Kallenberg W C M, Ledwina T. Consistency and Monte Carlo simulation of a data driven version of smooth goodness of fit tests[J]. *The Annals of Statistics*, 1995, 23(5): 1594-1608. 
- [33] Newey W K. Maximum likelihood specification testing and conditional moment tests[J]. *Econometrica*, 1985, 53(5): 1047-1070. 
- [34] Wei Guiwu, Zhao Xiaofei, Lin Rui. Some induced aggregating operators with fuzzy number intuitionistic fuzzy information and their

- application to group decision making[J]. International journal of computational intelligence systems, 2010, 3(1): 84-95.
- [35] Tauchen G. Diagnostic testing and evaluation of maximum likelihood models[J]. Journal of Econometrics, 1985, 30(1):415-443. 
- [36] West K D, McCracken M W. Regression based tests of predictive ability[J]. International Economic Review, 1998, 39:817-840. 
- [37] Kumar M, Yadav S P. Analyzing fuzzy system reliability using arithmetic operations on different types of intuitionistic fuzzy numbers[J]. Advances in Intelligent and Soft Computing, 2012, 130: 7250-736.
- [38] 郭凯红, 李文立. 权重信息未知情况下的多属性群决策方法及其拓展[J]. 中国管理科学, 2011, 19(5): 94-103. 浏览
- [39] Ghosh A, Bera A K. Smooth test for density forecast evaluation[R]. Working Paper, Singapore Management University, 2005.
- [40] 李广川, 刘善存, 邱苑华. 交易量持续期的模型选择:密度预测方法[J]. 中国管理科学, 2008, 16(1):131-141. 浏览
- [41] Yager R R. Induced aggregation operators[J]. Fuzzy Sets and Systems, 2003, 137(1): 59-69. 
- [42] Li Xiaoming, Xu Qing. Evaluating density forecasts of the model with a conditional skewed-t distribution for China's stock markets[J]. Applied Financial Economics, 2008, 18(3):213-227. 
- [43] Chen Xiaohong, Fan Yanqin. Evaluating density forecasts via the copula approach[J]. Finance Research Letters, 2004, 1(1):74-84. 
- [44] Hong Yongmiao, Lin Hai, Wang Shouyang. Modeling the dynamics of Chinese spot interest rates[J]. Journal of Banking and Finance, 2010, 34(5): 1047-1061. 
- [45] Park S Y, Zhang Yupeng. Density forecast evaluation using data-driven smooth test[R]. Working Paper, The Chinese University of Hong Kong, 2011.
- [46] Inglot T, Kallenberg W C M, Ledwina T. Power approximations to and power comparison of certain goodness-of-fit tests[J]. Scandinavian Journal of Statistics, 1994, 21:131-145.
- [47] Ledwina T. Data-driven version of Neyman's smooth test of fit[J].Journal of the American Statistical Association, 1994, 89(427):1000-1005. 
- [48] Inglot T, Ledwina T. Asymptotic optimality of data-driven Neyman's tests for uniformity[J]. The Annals of Statistics, 1996, 24(5):1982-2019. 
- [49] Inglot T, Ledwina T. Towards data driven selection of a penalty function for data driven Neyman tests[J]. Linear Algebra and its Applications, 2006, 417(1):124-133. 
- [50] Park S Y, Bera A K. Maximum entropy autoregressive condition heteroskedasticity model[J]. Journal of Econometrics, 2009, 150(2):219-230. 
- [51] Bollerslev T P, Wooldridge J M. Quasi-maximum likelihood estimation and inference in dynamic models with time varying covariances[J]. Econometric Reviews, 1992, 11(2):143-172. 
- [52] Premaratne G, Bera A K. A test for asymmetry with leptokurtic financial data[J]. Journal of Financial Econometrics, 2005, 3(2):169-187. 

没有找到本文相关文献