Modeling Asymmetry and Excess Kurtosis in Stock Return Data

Illinois Research & Reference Working Paper No. 00-123

25 Pages
Posted: 12 Feb 2001

Gamini Premaratne (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=260877)
University of Illinois at Urbana-Champaign - Department of Economics; University of Brunei Darussalam

Anil K. Bera (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=60248)
University of Illinois at Urbana-Champaign - Department of Economics

Date Written: November 2000

Abstract

This paper develops a flexible parametric approach to capture asymmetry and excess kurtosis along with conditional heteroskedasticity with a general family of distributions for analyzing stock returns data. Engle's (1982) autoregressive conditional heteroskedastic (ARCH) model and its various generalizations can account for many of the stylized facts, such as fat tails and volatility clustering. However, in many applications, it has been found that the conditional normal or Student's t ARCH process is not sufficiently heavy-tailed to account for the excess kurtosis in the data. Moreover, asymmetry in financial data is rarely modeled systematically. Therefore, there is a real need to find an asymmetric density that can be easily estimated and whose tails are heavier than the Student's t-distribution. Pearson type IV density is such a distribution, and it is much easier to handle than those that have been used in the literature, such as non-central t and Gram-Charlier distributions, to account for skewness and excess kurtosis simultaneously. Pearson type IV distribution has three parameters that can be interpreted as variance, skewness and kurtosis; and they can also be considered as different components of the risk premium. Modeling simultaneously time-varying behavior of mean, variance, skewness and kurtosis produces a better explanation of risk than mean-variance analysis only. These methodologies can also be used to analyze other financial data such as exchange rates, interest rates and spot and future prices.

Keywords: Pearson type IV, Excess Kurtosis, Skewness, GARCH

JEL Classification: C5

Download This Paper (Delivery.cfm/SSRN_ID259009_code010212130.pdf?abstractid=259009&mirid=1)

Open PDF in Browser (Delivery.cfm/SSRN_ID259009_code010212130.pdf?abstractid=259009&mirid=1&type=2)

0 References

0 Citations

ABSTRACT VIEWS	10,109
RANK	15,022

46 Citations

PlumX Metrics

(https://plu.mx/ssrn/a/?ssrn_id=259009)

Related eJournals

Capital Markets: Asset Pricing & Valuation eJournal (https://papers.ssrn.com/sol3/JELJOUR_Results.cfm?form_name=journalBrowse&journal_id=1508951)

Follow

Recommended Papers

Downside Risk (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=641843&rec=1&srcabs=259009&pos=1)
By Andrew Ang (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=94010), Joseph Chen (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=88071), ...

Downside Risk (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=875700&rec=1&srcabs=259009&pos=2)
By Joseph Chen (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=88071), Andrew Ang (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=94010), ...

Portfolio Selection with Higher Moments (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=634141&rec=1&srcabs=259009&pos=3)
By Campbell R. Harvey (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=16198), John Liechty (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=388621), ...

View more >

Feedback

Submit a Paper > (https://hq.ssrn.com/submission.cfm)

SSRN Quick Links

SSRN Rankings

About SSRN

(https://www.facebook.com/SSRNcommunity/)
(https://www.linkedin.com/company/493409?trk=tyah&trkInfo=clickedVertical%3Acompany%2CentityType%3AentityHistoryName%2CclickedEntityId%3Acompany_493409%2Cidx%3
(https://twitter.com/SSRN)