Journal of
Risk and Financial Management

MDPI

Editorial

Extreme Values and Financial Risk

Stephen Chan [1,*] and Saralees Nadarajah [2]

[1] Department of Mathematics and Statistics, American University of Sharjah, Sharjah P.O. Box 26666, UAE
[2] School of Mathematics, University of Manchester, Manchester M13 9PL, UK; saralees.nadarajah@manchester.ac.uk
* Correspondence: schan@aus.edu; Tel.: +971-6-515-4458

Received: 15 January 2020; Accepted: 16 January 2020; Published: 11 February 2020

check for updates

Since the 2008 financial crisis, modelling of the extreme values of financial risk has become important. The aim of this Special Issue of the Journal of Risk and Financial Management is to provide a collection of papers from leading experts in the area of extreme financial risk. This volume includes a wide variety of theoretical and empirical contributions that address a wide range of issues and topics related to catastrophic risk, drought risk, flood risk, health risk, and financial risk. A short abstract of the articles in this Special Issue are as follows.

Chu et al. (2017) provided the first GARCH (Generalized AutoRegressive Conditional Heteroskedasticity) modelling of the seven most popular cryptocurrencies. With the exception of Bitcoin, there appears to be little or no literature on the GARCH modelling of cryptocurrencies. Twelve GARCH models were fitted to each cryptocurrency, and their fits were assessed in terms of five criteria. Conclusions were drawn on the best fitting models, forecasts, and acceptability of value at risk estimates.

Ghitany et al. (2018) proposed an alternative generalization of the Pareto distribution and its properties were studied and the application of the proposed model to the earthquake insurance dataset was presented. The Pareto classical distribution is one of the most attractive in statistics, particularly in the scenario of actuarial statistics and finance. For example, it is widely used when calculating reinsurance premiums. In the last few years, many alternative distributions have been proposed to obtain better adjustments, especially when the tail of the empirical distribution of the data is very long.

Korkmaz et al. (2018) introduced a new three-parameter Pareto distribution and discuss the various mathematical and statistical properties of the new model. Some estimation methods of the model parameters were performed; moreover, the peaks-over-threshold method was used to estimate the Value-at-Risk (VaR) by means of the proposed distribution. Korkmaz et al. (2018) compared the distribution with a few other models to show its versatility in modelling data with heavy tails. VaR estimation with the Burr X Pareto distribution was presented using time series data, and the new model could be considered as an alternative VaR model against the generalized Pareto model for financial institutions.

D'Andrea et al. (2018) proposed a unified approach using the negative binomial distribution for modelling cure rates under the Kumaraswamy family of distributions. The estimation was made by the maximum likelihood. They checked the maximum likelihood asymptotic properties through some simulation setups. Furthermore, they proposed an estimation strategy based on the Negative Binomial Kumaraswamy-G generalized linear model. Finally, they illustrate the distributions proposed by using a real dataset related to health risk.

Altun et al. (2018) examined the Filtered Historical Simulation (FHS) model introduced by Barone-Adesi et al. (1999) both theoretically and empirically. The main goal of this study was to find an answer for the following question: "Does the assumption on innovation process play an important role for the Filtered Historical Simulation model?" For this goal, they investigated the performance of the FHS model with skewed and fat-tailed innovation distributions such as normal, skew normal, Student's-t, skew-T, generalized error, and skewed generalized error distributions. The performances of the FHS models were evaluated by means of unconditional and conditional likelihood ratio tests and loss functions. Based on the empirical results, they concluded that the FHS models with generalized error and skew-T distributions produced more accurate VaR forecasts.

Dos Santos et al. (2018) proposed applying the transmuted log-logistic (TLL) model, which is a generalization of the log–logistic model, in a Bayesian context. The log–logistic model has been used as it is simple and has a unimodal hazard rate, an important characteristic in survival analysis. Additionally, the TLL model was formulated by using the quadratic transmutation map, which is a simple way of derivating new distributions, and it adds a new parameter, where one introduces a skewness in the new distribution and preserves the moments of the baseline model. The Bayesian model was formulated by using the half-Cauchy prior, which is an alternative prior to an inverse Gamma distribution. In order to fit the model, a real dataset, which consisted of the time up to first calving of the polled Tabapua race, was used. Finally, after the model was fitted, an influential analysis was made and excluded only observations (influential points), so that the re-estimated model could fit the data better.

Ghosh (2017) considered a new modified class of FGM (Farlie–Gumbel–Morgenstern) bivariate copula for constructing several different bivariate Kumaraswamy type copulas and discussed their structural properties including dependence structures. A copula is a useful tool for constructing bivariate and/or multivariate distributions. It was established that the construction of bivariate distributions by this method allowed for greater flexibility in the values of the Spearman's correlation coefficient, ρ, and Kendall's τ.

Klebanov and Roozegar (2018) modified the classical Stieltjes transform in such a way as to generalize both Stieltjes and Fourier transforms. This transform allows the introduction of new classes of commutative and non-commutative generalized convolutions. A particular case of such a convolution for degenerate distributions appears to be the Wigner semicircle distribution.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflicts of interest.

References

Altun, Emrah, Huseyin Tatlidil, Gamze Ozel, and Saralees Nadarajah. 2018. Does the Assumption on Innovation Process Play an Important Role for Filtered Historical Simulation Model? *Journal of Risk Financial Management* 11: 7. [CrossRef]

Barone-Adesi, Giovanni, Kostas Giannopoulos, and Les Vosper. 1999. VaR without correlations for portfolios of derivative securities. *Journal of Futures Markets* 19: 583–602. [CrossRef]

Chu, Jeffrey, Stephen Chan, Saralees Nadarajah, and Joerg Osterrieder. 2017. GARCH Modelling of Cryptocurrencies. *Journal of Risk Financial Management* 10: 17. [CrossRef]

D'Andrea, Amanda, Ricardo Rocha, Vera Tomazella, and Francisco Louzada. 2018. Negative Binomial Kumaraswamy-G Cure Rate Regression Model. *Journal of Risk Financial Management* 11: 6. [CrossRef]

Dos Santos, Carlos A., Daniele C. T. Granzotto, Vera L. D. Tomazella, and Francisco Louzada. 2018. Hierarchical Transmuted Log-Logistic Model: A Subjective Bayesian Analysis. *Journal of Risk Financial Management* 11: 13. [CrossRef]

Ghitany, Mohamed E., Emilio Gómez-Déniz, and Saralees Nadarajah. 2018. A New Generalization of the Pareto Distribution and Its Application to Insurance Data. *Journal of Risk Financial Management* 11: 10. [CrossRef]

Ghosh, Indranil. 2017. Bivariate Kumaraswamy Models via Modified FGM Copulas: Properties and Applications. *Journal of Risk Financial Management* 10: 19. [CrossRef]

Klebanov, Lev B., and Rasool Roozegar. 2018. Modified Stieltjes Transform and Generalized Convolutions of Probability Distributions. *Journal of Risk Financial Management* 11: 5. [CrossRef]

Korkmaz, Mustafa Ç., Emrah Altun, Haitham M. Yousof, Ahmed Z. Afify, and Saralees Nadarajah. 2018. The Burr X Pareto Distribution: Properties, Applications and VaR Estimation. *Journal of Risk Financial Management* 11: 1. [CrossRef]