Identifying Fat-Tailed Distributions: Methods and Insights

Tianyu Xu, Rodica Ioana Lung, Florin Sebastian Duma

Centre for the Study of Complexity, Babeş-Bolyai University, Cluj Napoca, Romania

`tianyu.xu@ubbcluj.ro`

The identification of fat tails in financial data is a critical task in risk management and financial modeling, as it significantly influences the assessment of extreme events and the overall stability of financial systems. Fat-tailed distributions, which exhibit a higher frequency of extreme events than predicted by traditional Gaussian models, are prevalent in financial markets due to their inherent uncertainty and volatility. This phenomenon necessitates the application of advanced statistical methods to accurately analyze and model the tail behavior of financial data. Commonly used methodologies employed vary from specific statistics or measures such as kurtosis, qq-plots, value-at-risk, and expected-shortfall, but also specific indexes such as the obesity index [1] and methods from extreme value theory [2]. This paper aims to summarize some of the practical aspects related to the study of fat-tailed distributions with applications to the study of the Romanian BET index.

References

[1] R. M. Cooke, D. Nieboer, J. Misiewicz, *Fat-Tailed Distributions: Data, Diagnostics and Dependence*, Volume 1, Wiley, 2014.

[2] L. de Haan, A. Ferreira, *Extreme Value Theory: An Introduction.* Springer, 2010.