

Asymptotic normality of estimators for skew-normal distribution

Tõnu Kollo, Meelis Käärik and Anne Selart

University of Tartu, Estonia, tonu.kollo@ut.ee

Keywords: asymptotic normal distribution, multivariate skewness vector, skew-normal distribution

A. Azzalini and A. Dalla Valle introduced multivariate skew-normal distribution in the seminal paper in 1996 (Azzalini & Dalla Valle, (1996)). In Käärik, Selart & Käärik (2015) different parametrizations of skew-normal distribution were considered. In this talk we present asymptotic normal distributions for the shape/skewness vector and the dispersion matrix of the multivariate skew-normal distribution for two parametrizations. Also, an analytic expression and asymptotic normal law are derived for the skewness vector of the skew-normal distribution (Kollo, 2008). Expressions of the first four moments of the skew-normal distribution are used in derivation. Matrix derivative technique is applied for deriving the asymptotic distributions. Convergence to the asymptotic normal laws is examined both computationally and in a simulation experiment.

References

- [1] Azzalini A. and Dalla Valle, A. (1996). The multivariate skew-normal distribution. *Biometrika* **83**, 715–726.
- [2] Käärik, M., Selart, A., Käärik, E. (2015). On parametrization of multivariate skew-normal distribution. *Communications in Statistics - Theory and Methods* **44**, 1869–1885.
- [3] Kollo, T. (2008). Multivariate skewness and kurtosis measures with an application in ICA. *J. Multivariate Anal.* **99**, 2328–2338.