

## Random Regression Models Based on the Skew Elliptically Contoured Distribution Assumptions With Applications to Longitudinal Data

Shimin Zheng

Department of Psychiatry, UTSW Medical Center, Dallas, TX 75390, U.S.A. & Department of Finance, Nanjing Audit University, Nanjing 210029, P. R. China

Email: Shimin.Zheng@UTSouthwestern.edu

Uma Rao

Department of Psychiatry, UTSW Medical Center, Dallas, TX 75390, U.S.A.

Email: Uma.Rao@UTSouthwestern.edu

Alfred A. Bartolucci

Department of Biostatistics, UAB, Birmingham AL 35294, U.S.A.

Email: ABartolucci@ms.soph.uab.edu

Karan P. Singh

Department of Biostatistics, UNTHSC, Fort Worth, TX 76107, U.S.A.

Email: ksingh@hsc.unt.edu

### Abstract

Bartolucci *et al.* (2003) extended the distribution assumption from the normal (Lyles *et al.*, 2000) to the elliptical contoured distribution (ECD) for random regression models used in analysis of longitudinal data accounting for both undetectable values and informative drop-outs. In this paper, the random regression models are constructed on the multivariate skew ECD. A real data set is used to illustrate that the skew ECDs can fit some unimodal continuous data better than the Gaussian distributions or more general continuous symmetric distributions when the symmetric distribution assumption is violated. Also, a simulation study is done for illustrating the model fitness from a variety of skew ECDs. The software we used is SAS/STAT, V. 9.13.

**Keywords:** Multivariate analysis, skew elliptically contoured distributions, skew power exponential distributions, gamma distributions, maximum likelihood functions, censoring, informative drop-outs, undetectable.

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