



## Box-Cox symmetric distributions and applications to nutritional data

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We introduce and study the Box-Cox symmetric class of distributions, which is useful for modeling positively skewed, possibly heavy-tailed, data. The new class of distributions includes the Box-Cox  $t$ , Box-Cox Cole-Green and Box-Cox power exponential distributions, and the class of the log-symmetric distributions as special cases. It also allows the definition of new distributions, such as the Box-Cox slash distribution. It provides easy parameter interpretation, which makes it convenient for regression modeling purposes. Tail heaviness of Box-Cox symmetric distributions is studied and it is shown that they provide enough flexibility to handle outliers. Applications to 33 nutrients intake data are presented, and a comparison of alternative approaches is provided.

**Keywords:** Box-Cox transformation; Box-Cox power exponential distribution; Box-Cox  $t$  distribution; nutrients intake.