

L-moments based on two-step regression quantiles

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The conventional L-moments are analogues of the univariate mean and central moments and have similar interpretations but remain well-defined for all orders under merely a first moment assumption and possess other appealing properties as well. They are calculated using linear combinations of the expectation of ordered data. In practice, L-moments must usually be estimated from a random sample drawn from an unknown distribution as a linear combination of ordered statistics.

The aim of present contribution is to extend the L-moments to the linear regression model. We propose regression L-moments based on the two-step regression quantiles as a suitable tools of that extension. The two-step regression quantiles are one of possible modifications of the regression quantiles which can be seen as a generalization of the quantile idea in linear regression model. The properties of regression L-moments are illustrated on simulated and climatological data.

Key Words: Linear regression model, R-estimation, ordered statistics, quantile