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Comparison between extremal distributions: a conjecture and a partial proof

For some classes of distributions equipped with a partial order, we consider extremal distributions with respect to this partial order. Several comparison results are stated and the conjecture is formulated. The latter concerns sharp stochastic order comparisons between the Chebyshev-Markov extremal distributions and the extremal distributions with respect to the increasing convex order. For some main cases of importance, which include knowledge about the mean, variance, skewness and kurtosis of a distribution, the conjecture is proved. My Erdös offer is \$100 for a proof of the full conjecture and \$10 for a counterexample.

Ref. W. Hürlimann, Extremal Moment Methods and Stochastic Orders. Appl. in Actuarial Science and Finance. Monograph (1997, rev. Jan. 1998), 217 p.