

CHARACTERIZATIONS OF THE EXPONENTIAL DISTRIBUTION BY STOCHASTIC ORDERING PROPERTIES OF THE GEOMETRIC COMPOUND

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Abstract. Under the reliability NBU/NWU conditions, the exponential distribution is characterized by stochastic ordering properties which link the geometric compound with minimum order statistics or spacings of order statistics. This somewhat answers a question posed by Kakosyan, Klebanov and Melamed (1984, *Characterization of Distributions by the Method of Intensively Monotone Operators*, Springer, New York). We also show the related results based on the residual life in a renewal process and on record values. Finally, some fundamental properties of the NBUC/NWUC classes of life distributions are investigated.

Key words and phrases: Characterization, exponential distribution, geometric compounding model, stochastic order, increasing convex order, order statistics, record values, residual life.