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THE WEIGHTED GENERALIZED GAMMA DISTRIBUTION IS THE GENERALIZED GAMMA DISTRIBUTION

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It is pointed out that the weighted generalized gamma distribution of Priyadarshani and Oluyede [2] is a generalized gamma distribution.

Priyadarshani and Oluyede [2] introduced a new distribution referred to as the *weighted generalized gamma distribution* (WGGD) and studied various properties of it, including hazard function, reverse hazard function, moments, coefficient of variation, coefficient of skewness, coefficient of kurtosis and entropy measures.

According to Eq. (13) in Priyadarshani and Oluyede [2], the WGGD has its probability density function (pdf) specified by

$$\frac{\beta(\lambda^\beta - t)^{k+(c/\beta)} x^{k\beta+c-1} e^{-(\lambda^\beta - t)x^\beta}}{\Gamma(k + (c/\beta))} \tag{1}$$

for $\lambda^\beta > t$, $k\beta + c > 1$, $x > 0$, $\lambda > 0$, $\beta > 0$, $k > 0$, $t > 0$ and $c > 0$.

Let $\ell = k + (c/\beta)$ and $\mu = (\lambda^\beta - 1)^{1/\beta}$. Then (1) can be rewritten as

$$\frac{\mu\beta(\mu x)^{\ell\beta-1} e^{-(\mu x)^\beta}}{\Gamma(\ell)} \tag{2}$$

for $x > 0$, $\mu > 0$, $\beta > 0$ and $\ell > 0$. (2) is the pdf of the generalized gamma distribution (GGD) due to Stacy [3]; see Eq. (7) in Priyadarshani and Oluyede [2]. Hence, the WGGD is equivalent to the GGD.

The WGGD has five parameters. The GGD has only three parameters. The two additional parameters in the WGGD are redundant and in no way provide a generalization of the GGD.

Theoretical properties of the GGD (including hazard function, reverse hazard function, moments, coefficient of variation, coefficient of skewness, coefficient of kurtosis and entropy measures) have been studied by many authors; see Section 17.8.7 of Johnson, Kotz, and Balakrishnan [1] for an excellent review. Hence, the results presented in Priyadarshani and Oluyede [2] are the same as what has been known.

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