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The effects of square root transformation on a gamma distributed error component of a Multiplicative Error Model (MEM)

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In this paper, we studied the effect of square root transformation on a Gamma distributed error component of a Multiplicative Error Model (MEM) with mean 1.0 with a view to establishing the condition for the successful transformation. The probability density function (pdf), first and second moments of the square root transformed error component (e_t^*) were established. From the results of the study, it was found that the square root transformed error component was normal with unit mean and variance, approximately $\frac{1}{4}$ times that of the original error (e_t) before transformation except when the shape parameter is equal to one. However, Anderson Darling's test for normality on the simulated error terms confirmed normality for e_t^* at ($P < 0.05$). These showed that the square root transformation normalizes a non-normal Gamma distributed error component. Finally, numerical illustrations were used to back up the results established. Thus, a successful square root transformation is achieved when $1/4\sigma^2 < 1.0$ which implies that $\sigma^2 \leq 1/4$.

Biography

Dike O A has completed his MSc in Statistics from Abia State University, Uturu, and Doctoral in Statistics at Abia State University, Uturu. He is the Head of Department of Mathematics/Statistics in Akanu Ibiam Federal Polytechnic, Unwana, Nigeria. He has published more than 10 papers in reputed journals and is currently serving as a Reviewer in Central Bank of Nigeria (CBN) *Journal of Applied Statistics* and a member Editorial Board of School of Science Journal.

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