

## ON THE GEOMETRIC COMPOUNDING MODEL WITH APPLICATIONS

**Chin-Yuan Hu**  
**Gwo Dong Lin**

*Abstract:* Under the geometric compounding model, we first investigate the relationship between the compound geometric distribution and the underlying distribution, including the preservation of the infinite divisibility property. An interesting upper bound for the tail probability of the compound geometric distribution is provided by using only the mean of the underlying distribution. Secondly, we apply the obtained results to understand better the  $\mathcal{L}$ -class of life distributions. In particular, we strengthen a surprising result of Bhattacharjee and Sengupta [5] and show that there are life distributions  $F \in \mathcal{L}$  with the following properties:

- (i) the support of  $F$  consists of countably infinite points,
- (ii) the coefficient of variation of  $F$  is equal to one, and
- (iii)  $F$  is not in the HNBUE class (the harmonic new better than used in expectation class).

Finally, we apply geometric compounds to characterize the semi-Mittag-Leffler distribution and extend a known result about the exponential distribution.

**1991 AMS Mathematics Subject Classification:** Primary 60E05, 60G50, 62E10, 44A10.

**Key words and phrases:** Geometric compounding model,  $\mathcal{L}$ -class, HNBUE class, Laplace-Stieltjes transform, coefficient of variation, semi-Mittag-Leffler distribution.

THE FULL TEXT IS AVAILABLE [HERE](#)