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The Bivariate Generalized Waring Distribution and its Application to Accident Theory

By EVDOKIA XEKALAKI

University of Missouri, Columbia, USA

SUMMARY

The univariate generalized Waring distribution was shown by Irwin (1968, 1975) to provide a useful accident model which enables one to split the variance into three additive components due to randomness, proneness and liability. The two non-random variance components, however, cannot be separately estimated.

In this paper a way of tackling this problem is suggested by defining a bivariate extension of the generalized Waring distribution. Using this it is possible to obtain distinguishable estimates for the variance components and hence inferences can be made about the role of the underlying accident factors. The technique is illustrated by two examples.

Keywords: BIVARIATE GENERALIZED WARING DISTRIBUTION; ACCIDENT THEORY; PRONENESS; LIABILITY: WARING'S EXPANSION