# A multivariate discounted renewal sums with time-dependent claims in the presence of reporting/payment delays

Jae-Kyung Woo[1],

[1] *Department of Statistics and Actuarial Science, University of Hong Kong Pokfulam Road, Hong Kong,*
*jkwoo@hku.hk, Tel: (852) 3917-8324.*

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**Abstract**

In this talk, we consider an insurance portfolio containing several types of policies which may simultaneously face claims arising from the same catastrophe. A renewal counting process for the number of events causing claims and multivariate claim severities which are dependent on the occurrence time and/or the delay in reporting or payment are assumed. A unified model is proposed to study the time-dependent loss quantities. Furthermore, some numerical examples involving covariances and correlations of the different types of discounted aggregate (reported/unreported) claims until time $t$ are provided.

**Keywords:** Multiline insurance; Renewal process; Multivariate distribution; Discounted aggregate claim costs; Reported/Unreported claims; IBNR claims; Joint moments; Covariance; Correlation.