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guangwei fan* (gfan@maryville.edu), 13550 Conway Road, St. Louis, MO 63141. *A Stochastic Risk Model and its Applications to Actuarial Funding*. Preliminary report.

This paper studies a stochastic risk model and its applications to the actuarial funding for an insurance with k different lines of business, the j th line of the business faces the risk of losing Ljn during the first n periods for $j = 1, 2, \dots, k$. The total loss random variable $L1n + L2n + \dots + Lkn$ has dependency structure characterized by its joint distribution using a copula function. Traditional assumption of identical independent of losses does not recognize the aggregation of the losses from various business lines whose risk distribution vary. The dependency of risks discussed here could not be modeled by the multivariate normal distribution. By introducing copulas functions, we are able to estimate the probability of ruin to capture the dependence structure that exists among losses from multiple business lines. The modeling structure allows us to explore the impact of dependencies of risks on the total required actuarial funding. Various conditions and conclusions of the probability of ruin are studied. Applications of the model for the actuarial funding to provide general guidelines to minimize the probability of ruin are given. (Received August 21, 2006)