Premiums for Partial Coverage Insurance Policies Against Correlated Claims

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Consider two random dependent claims X and Y for which we wish to buy a partial insurance policy, such as the deductible (stop-loss) or simple proportional. In this paper a comparison is made between the sum P_0 of the premiums P_1 and P_2 , required by separate (independent) partial coverages against X and Y, with a single premium P required by a joint combined insurance policy for both X and Y.

As expected, P is shown to be smaller (larger) than P_0 when X and Y are negatively (positively) correlated. More general results are obtained for positively or negatively dependent X and Y.

Illustrative examples are given when X and Y

a) are uniformly distributed on (i) the 2-dimensional simplex $x + y \le 1$ (ii) a trapezoid and b) X and Y have a bivariate exponential distribution.

It is pointed out that analogous results can be obtained in multivariate situations.