

## A Hazard Rate Function for the Time of Ruin

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**Abstract :** This paper introduces a hazard rate function for the time of ruin to calculate the conditional probability of ruin for very small intervals. We call this function the force of ruin (FoR). We obtain the expected time of ruin and conditional expected time of ruin from the exact finite time ruin probability with exponential claim amounts. Then we introduce the FoR which gives the conditional probability of ruin and the condition is that ruin has not occurred at time  $t$ . We analyse the behavior of the FoR function for different initial surpluses over a specific time interval. We also obtain FoR under the excess of loss reinsurance arrangement and examine the effect of reinsurance on the FoR.

**Keywords :** conditional time of ruin, finite time ruin probability, force of ruin, reinsurance

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