

Cai, Jun; Dickson, David C. M.

On the expected discounted penalty function at ruin of a surplus process with interest.
(English) [Zbl 1074.91027](#)
Insur. Math. Econ. 30, No. 3, 389-404 (2002).

The paper deals with the ruin problem for an insurer, who receives interest on its surplus at time t , $U_\delta(t)$, at the constant force δ per unit time. In particular the expected value of a discounted penalty function at ruin is investigated.

Denoted by T_δ the time of ruin, u the initial surplus and α a non-negative parameter, the expected value of a discounted function of the surplus immediately prior to ruin and the deficit at ruin is given by

$$\Phi_{\delta,\alpha}(u) = E(w(U(T_\delta^-), |U(T_\delta)|)e^{-\alpha T_\delta} I(T_\delta < \infty)),$$

where $I(A)$ is the indicator function of a set A and w is a non-negative function.

The authors provide an integral equation involving $\Phi_{\delta,\alpha}$ and obtain the exact solution for $\Phi_{\delta,0}(0)$.

Finally some classical formulae concerning the distribution of the surplus immediately prior to ruin are generalized to the surplus process with interest.

Reviewer: [Emilia Di Lorenzo \(Napoli\)](#)

MSC:

91B30 Risk theory, insurance (MSC2010)
44A10 Laplace transform
45D05 Volterra integral equations
91B70 Stochastic models in economics

Cited in **1** Review
Cited in **51** Documents

Keywords:

ruin penalty function; surplus prior to ruin; deficit at ruin; Laplace transform; Volterra equation

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