

Asymptotic results for a Markov-modulated risk process with Investment

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In this paper we consider the Markov-modulated risk model with investment in a risky asset whose prices are modelled by a geometric Brownian motion. The premium rates, the rate of arrival of the claims and the distribution of the size of the claims themselves are influenced by an external environment, modelled by a homogenous Markov chain. We derive a system of integro-differential equations for the ruin probabilities and based on that, using Laplace transforms and regular variation theory, we obtain results for the asymptotic behaviour of these ruin probabilities and thus, the probability of ultimate ruin. Numerical examples to illustrate the difference with the classical and renewal risk model are also given.