A Markov additive risk process with a dividend barrier

Esther Frostig
Department of Statistics
University of Haifa, Israel

Abstract

We study a risk process where all the surplus above b is paid as dividends to the shareholders. The claims arrive according to a Markovian arrival process (MAP) with a Brownian motion component. The premium rate, the claim amount distribution, and the volatility coefficient of the Brownian motion depend on a random environment, that evolves as a continuous time Markov chain. When the claims amount are phase type, we consider both positive and negative claims. For this case we obtain the expected discounted dividends, the distribution of the dividends, the expected discounted penalty function. We apply the semi-regenerative structure of the model, the fluid version of the model, results of first exit for spectrally negative Lévy process, and change of measure techniques to obtain linear equations for the quantities of interest.