Asymptotic analysis of a risk process with high dividend barrier

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Abstract

In this paper we study a risk model with constant high dividend barrier. We apply Keilson's (1966) results on the asymptotic distribution of the time until occurrence of a rare event in regenerative process. We show that when the initial reserve is high, the asymptotic distribution of the time to ruin, and the amount of dividend until ruin are exponential . In the case that the initial reserve is small, we show that the time to ruin is a mixture of the exponential distribution and the distribution of the time to ruin in a risk process without barrier, given that ruin occurs. In this case the distribution of the amount of dividends is a mixture of exponential distribution and distribution degenerate at 0. We apply results from the theory of cycle maxima to obtain the parameters of the distributions.

Key words: Busy cycle, idle period, cycle maxima, Subexponential distribution, GI/G/1 queue, regenerative process

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