

THEORETICAL ASPECTS AND SIMULATION
OF A GENERALIZED SURPLUS PROCESS
WITH A LOGARITHMIC BARRIER

ALIN V. ROȘCA

Abstract. In this article we consider a generalization of the classical Lundberg surplus process. In the presence of the logarithmic dividend barrier we assume that the company also receives interest on its reserve with a constant interest rate. We derive equations for the survival probability and the expected sum of discounted dividend payments. We give important theoretical results concerning the existence and uniqueness of the corresponding solutions. We use Monte Carlo (MC), Quasi-Monte Carlo (QMC) techniques and the direct simulation approach in order to estimate these quantities. We also perform numerical tests, in which we compare the accuracy of these algorithms.

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Key words. Generalized risk process, Monte Carlo method, quasi-Monte Carlo method, logarithmic dividend barrier, survival probability, expected discounted dividend payments.

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“Babeș-Bolyai” University
Faculty of Economics and Business Administration
Str. Teodor Mihali, Nr. 58-60
Cluj-Napoca, Romania
E-mail: alin.rosca@econ.ubbcluj.ro