

Optimal dividend policies with penalties at bankruptcy

Pablo Azcue and Nora Muler.

Departamento de Matemática.

Universidad Torcuato Di Tella.

pazcue@utdt.edu and nmuler@utdt.edu

Abstract: We consider in this paper the optimal dividend problem for an insurance company whose uncontrolled reserve process evolves as a classical Cramér-Lundberg model with arbitrary claim-size distribution. The objective is to find a strategy consisting on dividend payment policies, which maximizes the difference between the cumulative expected discounted dividend pay-outs until the time of bankruptcy and the expected discounted value of a function of the deficit at ruin. We show that the optimal value function is the smallest viscosity solution of the associated first-order integro-differential Hamilton-Jacobi-Bellman equation.

We study the regularity of the optimal value function. We find a verification result to check optimality, even in the case that the optimal value function is not differentiable.

Finally, we give an example where the optimal dividend strategy is not barrier and the optimal value function is not differentiable. In this example the claim-size distribution is smooth. This work is an extension of a paper of Azcue and Muler (2005) where there is no penalty, the paper of Gerber, Lin and Yang (2006) where the problem of optimal barrier strategy is considered and the papers of Loeffen (2009) and Albrecher & Thonhauser (2007) where the function of the deficit at ruin is constant and the claim-size distribution assures that the optimal strategy is barrier.

References:

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