Dividend maximization under transaction costs in the compound Poisson risk model

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After the introduction of the classical collective risk model in 1903 by F. Lundberg to describe the free surplus process of an insurance portfolio, the probability of ruin of such a portfolio was among the prime quantities of interest in this field. However, a trajectory of the surplus process that does not lead to ruin in this model will exceed every finite level, which is typically unrealistic in practice. That is why in 1957 B. de Finetti proposed, economically motivated, to measure the performance of an insurance portfolio by the maximal dividend payout that can be achieved over its lifetime.

We characterize the value function of maximizing the total discounted utility of dividend payments for a collective insurance risk model when strictly positive transaction costs are included, leading to an impulse control problem. We show how to derive an optimal strategy for exponential claim amounts and construct a numerical procedure to deal with general claim amount distributions.