

Two numerical approaches for the identification of optimal dividend strategies

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Abstract

While the optimality of band strategies for dividend payouts in risk theory is well-known, the identification of the actual values of the optimal bands is challenging, and only a few explicit cases are known and documented. In this talk we present two approaches for numerically optimizing band levels in dividend models in risk theory in more generality. These approaches are based on a shift of focus towards the function obtained when we fix the initial capital and consider the value as a function of the band levels. We first discuss evolutionary algorithms and some of their general properties, and subsequently tailor them towards the concrete application leading to a competitive tool for approximating optimal solutions. We then derive a recursive gradient-based method that allows us to effectively compute band levels when the necessary functions are sufficiently smooth. We illustrate the strength and speed of the methods for various dividend models, identifying optimal barrier and band levels in simple optimal dividend problems and discuss their limitations and advantages over alternative procedures.

Keywords: De Finetti model, barrier/band strategy, Cramér-Lundberg process, dividend payouts, Gerber-Shiu function, evolutionary strategies

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