

Optimal dividends for a NatCat insurer in the presence of a climate tipping point

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In a recent work, we studied optimal dividend strategies for an insurance company dealing with natural catastrophe (NatCat) claims, aimed at maximizing the expected discounted dividends throughout the portfolio's duration. We assumed a shot-noise Cox process assumption for claim arrivals. This talk extends the results to the case that anticipates a climate tipping point within the NatCat portfolio, after which the claim intensity and/or the distribution of claim sizes for the underlying risks experiences irreversible deterioration. Under a specific assumption regarding the dynamics of such an event, we show that the associated system of two-dimensional stochastic control problems (using the Dynamic Programming principle and the notion of viscosity solution for the associated HJB equation) can be uniformly approximated through the discretization of the current surplus and claim intensity level. We present our findings with various numerical examples and examine the sensitivity of optimal dividend strategies in relation to the occurrence of a climate tipping point. We also consider the case in which the premium rates depends on the claim intensity.

Keywords: Optimal dividends; Shot-noise Cox process; Hamilton-Jacobi-Bellman equation; Climate Change.