An Alternative Approach to Bonus Malus

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Abstract

Under the assumptions of an open portfolio, i.e., considering that a policyholder can transfer his policy to another insurance company, a continuous arrival of new policyholders into a portfolio that can be placed into any of the bonus classes and not only in the "starting class", we developed a model (Stochastic Vortices Model) that estimates the Long Run Distribution for a Bonus Malus System. With these hypothesis, the model render to be most representative of reality.

With the obtained Long Run Distribution, a few optimal bonus scales were calculated, such as Norberg’s [1979], Borgan, Hoem’s & Norberg’s [1981], Gilde & Sundt’s [1989] and Andrade e Silva’s [1991].

To confront the results, since this was the first application of the model in Bonus Malus Systems, we used the Classic Model for Bonus Malus and the Open Model developed by Centeno & Andrade e Silva [2001].

The results of the Stochastic Vortices and the Open Model of Centeno & Andrade e Silva [2001] are highly similar and distant from the Classic Model ones.

Keywords: Bonus Malus, Stochastic Vortices, Long Run Distribution, Optimal Bonus Scales.

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