

Change of Measure for Compound Mixed Renewal Processes with Applications to Premium Calculation Principles

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Abstract

Given a compound mixed renewal process S under a probability measure P , we characterize all probability measures Q on the domain of P such that Q and P are progressively equivalent and S remains a compound mixed renewal process under Q . Such a characterization can be achieved by reducing compound mixed renewal processes to compound renewal ones under the existence of proper regular conditional probabilities, and by applying a corresponding characterization for compound renewal processes proven in [3], Theorem 3.9. The latter result is then transferred from compound renewal processes to compound mixed renewal ones. As a consequence, we prove that any compound mixed renewal process can be converted into a compound mixed Poisson one through a change of measures, and we show how this approach is related to equivalent martingale measures and to pricing actuarial risks.

Keywords: Compound mixed renewal process, Change of measures, Progressively equivalent (martingale) measures, Premium calculation principle.

References

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