

On the analysis of time dependent claims in a class of birth process claim count models

David Landriault*, Gordon E. Willmot† and Di Xu ‡

Department of Statistics and Actuarial Science, University of Waterloo, 200 University Avenue West, Waterloo, Canada

March 25, 2015

Abstract

This talk is focused on the analysis of the time dependent aggregate claim distribution, which is an important insurance risk model for quantifying the total claim amounts to the insurers. The knowledge of the claims experience is essential for insurers in pricing, reserving, solvency requirement, and more generally, risk management. An integral representation is derived for the sum of all claims over a finite interval when the claim value depends upon its incurral time. These time dependent claims, which generalize the usual compound model for aggregate claims, have insurance applications involving models for inflation and payment delays. The number of claims process is assumed to be a (possibly delayed) nonhomogeneous birth process, which includes the Poisson process, contagion models, and the mixed Poisson process, as special cases. Known simplified compound representations in these special cases are easily generalized to the conditional case, given the number of claims at the beginning of the interval. Applications to the case involving “two stages” are also considered.

Keywords: Translation probabilities, inflation, IBNR, contagion, mixed Poisson, compound distribution, random sum.

*Email: dlandria@uwaterloo.ca

†Email: gewillmo@uwaterloo.ca

‡Speaker; Email: d33xu@uwaterloo.ca; Phone: +15197226158