

ON RUIN PROBABILITY AND RELATED DUAL MODELS

Vladimir K. Kaishev, Cass Business School, City University London, UK, v.kaishev@city.ac.uk

Zvetan Ignatov, Sofia University

Dimitrina Dimitrova, Shouqi Zhao, Cass Business School, City University London.

We consider a reasonably general insurance risk model under which, cumulative premium income is modelled by any non-decreasing premium income function, consecutive claims arrive according to a point process and their severities may be dependent with any joint distribution. Under some assumptions on the claim arrival (point) process, we give closed form expressions, in terms of (generalized) Appell polynomials, for some risk related quantities such as the finite-time probability of ruin and the deficit at ruin. We further provide two dual interpretations of this model, one is the so called dual risk model and the second one is a dual queuing-theoretic model. We show that the ruin probabilistic results obtained under the insurance risk model are elegantly transferred to the context of the two dual models considered, thus providing new insights into these dual areas of research.