

I-Delaporte Process and Applications

Meglana D. Lazarova¹, Leda D. Minkova²

¹ University of National and World Economy
meglena.laz@gmail.com

² Faculty of Mathematics and Informatics
Sofia University "St. Kl. Ohridski"
leda@fmi.uni-sofia.bg

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In this paper we introduce a mixed Pólya-Aeppli process with shifted gamma mixing distribution and call it an Inflated-parameter Delaporte process (I-Delaporte). We derive the probability mass function, recursion formulas and some basic properties. Then we define the process as a pure birth process and derive differential equations for the probabilities. As application, we consider a risk model in which the claim counting process is the defined I-Delaporte process. For the defined risk model we derive the joint distribution of the time to ruin and the deficit at ruin as well as the ruin probability. We discuss in detail the particular case of exponentially distributed claims.