Using Nonhomogeneous Poisson Process with Compound Distribution to Price Catastrophe Options

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Abstract : In this paper, we derive a pricing formula for catastrophe equity put options (or CatEPut) with non-homogeneous loss and approximated compound distributions. We assume that the loss claims arrival process is a nonhomogeneous Poisson process (NHPP) representing the clustering occurrences of loss claims, the size of loss claims is a sequence of independent and identically distributed random variables, and the accumulated loss distribution forms a compound distribution and is approximated by a heavy-tailed distribution. A numerical example is given to calibrate parameters, and we discuss how the value of CatEPut is affected by the changes of parameters in the pricing model we provided.

Keywords : catastrophe equity put options, compound distributions, nonhomogeneous Poisson process, pricing model

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