

NON-PARAMETRIC THRESHOLD ESTIMATION FOR CLASSICAL RISK PROCESS PERTURBED BY DIFFUSION

CHUNHAO CAI

Nankai University, China, chunhao_cai@nankai.edu.cn

HONGLONG YOU *Nankai University, China*

JUNYI GUO *Nankai University, China*

Estimation of Survival Probability; Integrated Squared Error ; Laplace Transform:

In this paper, we consider a macro approximation of the flow of a risk reserve. We assume that the underlying process consists of a Brownian motion plus negative jumps. The process is observed at discrete time points. Because we cannot directly observe each jump time and size then we will make use of the threshold method for identifying the times when jumps larger than a suitably defined threshold occurred. We estimate the jump size and give its goodness-of-fit test. Finally, we construct the estimator of survival probability and proof its weak consistency in a sense of the integrated squared error (*ISE*). Moreover, we will introduce some results of the models with the fractional Brownian motion.

References

- [1] EW. Frees (1986) *Nonparametric estimation of the probability of ruin*, Astin Bulletin 16, 81–90.
- [2] F. Dufresne and H. U. Gerber (1991) *Risk theory for the compound Poisson process that is perturbed by diffusion* Insurance: Mathematics and Economics 10, 51–59