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ON THE STRUCTURE OF A CLASS OF DISTRIBUTIONS OBEYING THE PRINCIPLE OF A SINGLE BIG JUMP

Hui Xu
Michael Scheutzow
Yuebao Wang
Zhaolei Cui

Abstract: In this paper, we present several heavy-tailed distributions belonging to the new class $\mathcal{J}$ of distributions obeying the principle of a single big jump introduced by Beck et al. (2015). We describe the structure of this class from different angles. First, we show that heavy-tailed distributions in the class $\mathcal{J}$ are automatically *strongly heavy-tailed* and thus have tails which are not too irregular. Second, we show that such distributions are not necessarily weakly tail equivalent to a subexponential distribution. We also show that the class of heavy-tailed distributions in $\mathcal{J}$ which are neither long-tailed nor dominatedly-varying-tailed is not only non-empty but even quite rich in the sense that it has a non-empty intersection with several other well-established classes. In addition, the integrated tail distribution of some particular of these distributions shows that the Pakes–Veraverbeke–Embrechts theorem for the class $\mathcal{J}$ does not hold trivially.

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