

**Tang, Qihe; Tsitsiashvili, Gurami**

**Randomly weighted sums of subexponential random variables with application to ruin theory.** (English) [Zbl 1049.62017](#)

*Extremes* 6, No. 3, 171-188 (2003).

Summary: Let  $\{X_k, 1 \leq k \leq n\}$  be  $n$  independent and real-valued random variables with common subexponential distribution function, and let  $\{\theta_k, 1 \leq k \leq n\}$  be other  $n$  random variables independent of  $\{X_k, 1 \leq k \leq n\}$  and satisfying  $a \leq \theta_k \leq b$  for some  $0 < a \leq b < \infty$  for all  $1 \leq k \leq n$ . This paper proves that the asymptotic relations

$$\mathbb{P} \left( \max_{1 \leq m \leq n} \sum_{k=1}^m \theta_k X_k > x \right) \sim \mathbb{P} \left( \sum_{k=1}^n \theta_k X_k > x \right) \sim \sum_{k=1}^n \mathbb{P}(\theta_k X_k > x)$$

hold as  $x \rightarrow \infty$ . In doing so, no assumption is made on the dependence structure of the sequence  $\{\theta_k, 1 \leq k \leq n\}$ . An application to ruin theory is proposed.

**MSC:**

**62E20** Asymptotic distribution theory in statistics

**91B30** Risk theory, insurance (MSC2010)

**60G50** Sums of independent random variables; random walks

Cited in **3** Reviews  
Cited in **68** Documents

**Keywords:**

asymptotics; dominated variation; ruin probability; subexponentiality; uniformity; heavy tailed distributions

**Full Text:** [DOI](#)