

LIMIT THEOREMS FOR PRODUCTS OF SUMS OF INDEPENDENT
RANDOM VARIABLES

Tomasz K. Krajka
Zdzisław Rychlik

Abstract: Let $\{X_n, n \geq 1\}$ be a sequence of independent random variables with finite second moments and $\{N_n, n \geq 1\}$ be a sequence of positive integer-valued random variables. Write $S_n = \sum_{k=1}^n (X_k - EX_k)$, $n \geq 1$, and let N be a standard normal random variable. In the paper the convergences

$$\left(\prod_{k=1}^n (S_k/a_k + 1) \right)^{\gamma_n} \xrightarrow{\mathcal{D}} e^N \quad \text{and} \quad \left(\prod_{k=1}^{N_n} (S_k/a_k + 1) \right)^{\gamma_n} \xrightarrow{\mathcal{D}} e^N$$

are considered for some sequences $\{a_n\}$ and $\{\gamma_n\}$ of positive integer numbers such that $S_n + a_n \geq 0$ a.e. The case when γ_n are random variables is also considered. The main results generalize the main theorems presented by Pang et al. [3].

2000 AMS Mathematics Subject Classification: Primary: 60F05; Secondary: 60G50.

Keywords and phrases: Lognormal distribution; randomly indexed product of sums; central limit theorem; self-normalized.

THE FULL TEXT IS AVAILABLE [HERE](#)