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A REMARK ON THE EXACT LAWS OF LARGE NUMBERS FOR RATIOS OF INDEPENDENT RANDOM VARIABLES

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Abstract. Let $(X_n)_{n\in\mathbb{N}}$ and $(Y_n)_{n\in\mathbb{N}}$ be two sequences of i.i.d. random variables which are independent of each other and all have the distribution of a positive random variable ξ with density f_ξ. We study weighted strong laws of large numbers for the ratios of the form $\frac{1}{b_n}\sum_{k=1}^{n} a_k \frac{X_k}{Y_k}$ in the cases when $\mathbb{E}\xi = \infty$ or $\lim_{x\to 0^+} f_\xi(x) = 0$ or f_ξ is unbounded. This research complements some results known so far.

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Key words and phrases: almost sure convergence, law of large numbers, i.i.d. random variables.

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