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Generalized St. Petersburg games revisited

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Abstract

The topic of the present paper is a generalized St. Petersburg game in which the distribution of the payoff X is given by $P(X = sr^{k-1}) = pq^{k-1}$, $k = 1, 2, \dots$, where $p + q = 1$, and $s, r > 0$. As for main results, we first extend Feller's classical weak law and Martin-Löf's 1985-theorem on convergence in distribution along the 2^n -subsequence. In his 2008-paper Martin-Löf's considers a truncated version of the game and the problem How much does one gain until "game over", and a variation where the player can borrow money but has to pay interest on the capital, also for the classical setting. We extend these problems to our more general setting. We close with some additional results and remarks.