

SOME NEW RESULTS CONCERNING THE RANDOM DIFFERENCE EQUATION

DARIUSZ BURACZEWSKI

Random difference equation is the Markov chain on \mathbf{R} given by $X_n = A_n X_{n-1} + B_n$, where (B_n, A_n) are independent identically distributed random variables distributed in $\mathbf{R} \times \mathbf{R}^+$. It is well known that if $\mathbb{E} \log A_1 < 0$, then the process possesses a unique stationary measure ν . Moreover if $\mathbb{E} A_1^\alpha = 1$ (and some further hypotheses are satisfied) then the measure $\nu(dx)$ behaves at infinity like $C_+ \cdot \frac{dx}{x^{\alpha+1}}$ (this result is due to Kesten, 1973). Recently together with J. Collamore, T. Mikosch (Copenhagen), E. Damek, J. Zienkiewicz (Wroclaw) we developed a new technique allowing us to describe limiting behavior of X_n , relying on precise analysis of paths of X_n . We proved new results concerning the ruin probability, an explicit formula for the limiting constant C_+ , large deviations for partial sums of X_n . During the talk we will state our results and describe shortly main ideas of the proofs.