

TAILS OF PERPETUITIES AT FINITE ENDPOINTS OF THE SUPPORT

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We consider a random variable X defined as a solution of the affine stochastic equation

$$X \stackrel{d}{=} AX + B, \quad X \text{ and } (A, B) \text{ are independent.}$$

Under mild conditions, X may be represented as the series

$$X \stackrel{d}{=} \sum_{j=1}^{\infty} B_j \prod_{k=1}^{j-1} A_k, \quad (A_n, B_n)_{n=1}^{\infty} \text{ are i.i.d. copies of } (A, B).$$

One of the main goals in the theory is to find asymptotics of $\mathbb{P}(X > t)$ as $t \rightarrow \infty$. There exists a vast literature on such results, which depend heavily on the properties of (A, B) . However, the case of X with bounded support seems to be addressed only in [1] (under very special assumptions on (A, B)).

In the talk I will discuss asymptotics of

$$t \mapsto \mathbb{P}(X < \text{ess inf } X + t) \quad \text{as } t \rightarrow 0+$$

when $\text{ess inf } X > -\infty$ and $\mathbb{P}(X = \text{ess inf } X) = 0$

REFERENCES

- [1] Krzysztof Burdzy, Bartosz Kołodziejek and Tvrtko Tadić. Inverse Exponential Decay: Stochastic Fixed Point Equation and ARMA Models. *to appear in Bernoulli*, pages 1–32, 2019.