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SELF-SIMILAR PROCESSES AS WEAK LIMITS OF A RISK RESERVE PROCESS

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Abstract: Self-similar processes are closely connected with limit theorems for identical and in general strongly dependent variables. Moreover, since they allow heavy-tailed distributions and provide an additional "adjusting" parameter H, they appear to be interesting in the area of risk models. In this paper we prove that only self-similar processes with stationary increments appear naturally as weak limits of a risk reserve process, and conversely every finite mean H-self-similar process with stationary increments for $0 < H \leq 1$ can result as the weak approximation. A lower bound for general self-similar processes with drift is also provided.

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