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Joint aggregation of random-coefficient AR(1) processes with common innovations. (English)

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Summary: We discuss joint temporal and contemporaneous aggregation of N copies of stationary random-coefficient AR(1) processes with common i.i.d. standardized innovations, when N and time scale n increase at different rate. Assuming that the random coefficient a has a density, regularly varying at $a = 1$ with exponent $-1/2 < \beta < 0$, different joint limits of normalized aggregated partial sums are shown to exist when $N^{1/(1+\beta)}/n$ tends to (i) ∞, (ii) 0, (iii) $0 < \mu < \infty$. The paper extends the results in [the authors, Stochastic Processes Appl. 124, No. 2, 1011–1035 (2014; Zbl 1400.62194)] from the case of idiosyncratic innovations to the case of common innovations.

MSC:

62M10 Time series, auto-correlation, regression, etc. in statistics (GARCH)
60G22 Fractional processes, including fractional Brownian motion
60G15 Gaussian processes
60G18 Self-similar stochastic processes
60H05 Stochastic integrals

Keywords:

aggregation; random-coefficient AR(1) process; intermediate scaling

Full Text: DOI

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