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Moment conditions for random coefficient AR(∞) under non-negativity assumptions

We consider random coefficient autoregressive models of infinite order (AR(∞)) under the assumption of non-negativity of the coefficients.
We develop novel methods yielding sufficient or necessary conditions for finiteness of moments, based on combinatorial expressions of first and second moments. The methods based on first moments recover previous sufficient conditions by Doukhan and Wintenberger (2008) in our setting. The second moment method provides, in particular, a necessary and sufficient condition for finiteness of second moments which is different, but shown to be equivalent to the classical criterion of Nicholls and Quinn (1982) in the case of AR(p) models with finite order $p < 1$. We further illustrate our results through examples.
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