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The problem of existence of positive solutions in models of mathematical economics.
(Ukrainian) [Zbl 1054.91558](#)

Dopov. Nats. Akad. Nauk Ukr., Mat. Pryr. Tekh. Nauky 1999, No. 6, 35-38 (1999).

The authors discuss the possibility of modelling some economical processes by means of 2nd order difference and differential systems. From this point of view the problem of existence of positive solutions for the equations $y(k+2) = Ay(k) + a(k)$, $k = 0, 1, 2, \dots$, and $y'' = Hy + f(t)$ (1) is studied. Here $A = \{a_{ij}\}_{i,j=1}^n$ and $H = \{h_{ij}\}_{i,j=1}^n$ are constant matrices, $a(\cdot) : \mathbf{Z}_+ \mapsto \mathbb{R}_+^n$, $f : \mathbb{R} \mapsto \mathbb{R}_+^n$. The authors arrives to the following conclusion: in order that solutions of (1) be nonnegative for arbitrary nonnegative initial data and arbitrary nonnegative $f(t)$ it is necessary that $h_{ij} \geq 0, i \neq j, i, j = 1, \dots, n$, and it is sufficient that $h_{ij} \geq 0, i, j = 1, \dots, n$.

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MSC:

91B62 Economic growth models

34A30 Linear ordinary differential equations and systems, general

34A12 Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions to ordinary differential equations

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mathematical economics; positive solution; Perron-Frobenius theorem