

The intermittence and percolation nature of large-scale fractal structure in turbulent mode of financial transaction management

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Abstract

It is shown that the empirical distribution of the daily loss of the Standard&Poor stock index has a spectral density with an intermittency index $\alpha \sim 4/3 + 5/3$. It is noted that the spectrum $k^{-\alpha}$ is known scaling representation of spectrum of an isotropic turbulence in space of motion with dimension of 3, describing the dynamics of high-frequency perturbations of medium or, in other words, structure of small-scale turbulized medium as skeleton of the vortex cluster with fractal dimension $D=\alpha$, where $\alpha \sim 4/3, 5/3$. It is shown that the value of scaling index $\alpha = 5/3$ gives known spectrum of Kolmogorov-Obukhov. The possibility of financial analog existence of physical homogeneous turbulence, i.e. financial small-scale turbulence, which develops in three-dimensional space of motion, is discussed.

PACS: 47.53; 05.45a

Keywords

Turbulence; financial liquid; skeleton of the vortices; fractal dimension; intermittence;
Standard&Poor stock index

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