EXPONENTIAL WEALTH DISTRIBUTION IN DIFFERENT DISCRETE ECONOMIC MODELS

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Exponential distribution is ubiquitous in the framework of multi-agent systems. Usually, it appears as an equilibrium state in the asymptotic time evolution of statistical systems. It has been explained from very different perspectives. In statistical physics, it is obtained from the principle of maximum entropy [1]. In the same context, it can also be derived without any consideration about information theory, only from geometrical arguments under the hypothesis of equiprobability in phase space [2]. Also, several multi-agent economic models based on mappings, with random, deterministic or chaotic interactions, can give rise to the asymptotic appearance of the exponential wealth distribution [3, 4, 5]. An alternative approach to this problem in the framework of iterations in the space of distributions will be presented [6]. Concretely, the new iteration given by

$$f_{n+1}(x) = \iint_{u+v>x} \frac{f_n(u)f_n(v)}{u+v} \, du dv \, .\tag{1}$$

It is found that the exponential distribution is a stable fixed point of this type of systems (1). From this point of view, it is easily understood why the exponential wealth distribution (or by extension, other kind of distributions) is asymptotically obtained in different multi-agent economic models (*).

References

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