Quantitative Finance > Statistical Finance

Equilibrium Distribution of Labor Productivity: A Theoretical Model

Hideaki Aoyama, Hiroshi Iyetomi, Hiroshi Yoshikawa

(Submitted on 11 May 2012)

We construct a theoretical model for equilibrium distribution of workers across sectors with different labor productivity, assuming that a sector can accommodate a limited number of workers which depends only on its productivity. A general formula for such distribution of productivity is obtained, using the detail-balance condition necessary for equilibrium in the Ehrenfest-Brillouin model. We also carry out an empirical analysis on the average number of workers in given productivity sectors on the basis of an exhaustive dataset in Japan. The theoretical formula succeeds in explaining the two distinctive observational facts in a unified way, that is, a Boltzmann distribution with negative temperature on low-to-medium productivity side and a decreasing part in a power-law form on high productivity side.

Comments:	11pages, 5 figures, and 1 table
Subjects:	**Statistical Finance (q-fin.ST)**; Data Analysis, Statistics and Probability (physics.data-an); Physics and Society (physics.soc-ph)
Report number:	KUNS-2400
Cite as:	**arXiv:1205.2470 [q-fin.ST]**
	(or **arXiv:1205.2470v1 [q-fin.ST]** for this version)

Submission history

From: Hideaki Aoyama [view email]
[v1] Fri, 11 May 2012 09:53:17 GMT (756kb)

Which authors of this paper are endorsers?